Rush-Presbyterian-St. Luke's Medical Center

The Magazine

Arthritis: not the hopeless disease of yesterday

The pluses of a four-year medical curriculum

Quality assurance in nursing

Multi-disciplinary approach to arthritis
treatment at RPSLMC

Spring 1976

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Arthritis:

No Longer the Hopeless Disease of Yesterday

At Rush-Presbyterian-St. Luke's Medical Center, many specialties aid in the treatment of this often disabling condition.

By Sara R. O'Connell

When Sharon Barnes was admitted to Presbyterian-St. Luke's Hospital for treatment of rheumatoid arthritis (r.a.), she did not know that the people she would meet in the following weeks would, quite literally, help change her entire lifestyle and teach her to live with her painful disease.

Sharon is not her real name. But her arthritis is real. The word means inflammation of a joint, and rheumatoid is the most serious of the many types that exist. The rheumatoid part of the name designates its form. A chronic disease that affects many joints, it is an inflammation of the membranes found in joint cavities and around ligaments and tendons; and it interferes with total body health causing weight loss, fever, listlessness, and sometimes anemia.

The disease and the pain cannot be alleviated with two aspirins, but it need not cause the frightening, debilitating results that the physicians encountered in Sharon's case. She is among the 30 percent of patients with a more severe form of the disease—the majority of victims can live quite comfortably with only minor modifications in their lifestyle—but much of the damage to Sharon's joints and bones could have been prevented if she had accepted her doctor's diagnosis and advice years earlier.

Now she was ready; she could no longer manage the busy schedule of home and family, job and social life. She was convinced, at her first visit with one of six rheumatologists (subspecialists in the treatment of arthritis) connected with the Medical Center, Evan Barton, M.D. that she would benefit from inpatient treatment. The arrangements were made that day from his office in the Professional Building at the Medical Center, and she entered the hospital before the week was over.

As soon as he had established an appropriate preliminary treatment, Dr. Barton called on the other specialists available at Rush-Presbyterian-St. Luke's, so they could integrate their individual specialties and disciplines into a total course of treatment for Sharon Barnes.

The group included internists, immunologists, psychologists, physical and occupational therapists, orthopedic surgeons, and others as specific needs arose.

Their job was to explain Sharon's disease to her, formulate an in-hospital and future therapeutic course of treatment, and help her overcome the anger and frustration she felt toward her condition.

"The disease often hits people in their most productive years," says Paul Glickman, M.D., one of the many physicians in private practice who prescribes the in-hospital treatment program at Presbyterian-St. Luke's for his arthritis patients. Dr. Glickman, who is a past-president of the Chicago Rheumatism Society, practices with Arnold Black, M.D., another past-president and Harvey Golden, M.D., the current president. "Our group practice is 75 percent rheumatology so we see the serious cases. The patients, the sex ratio is 3 to 1 female are often in their 20s and 30s, and have a hard time dealing with their disease. Rheumatology is a fairly new specialty, just board-certifiable for the last four years, and there are only about a dozen or so trained rheumatologists in Chicago. We need the kind of comprehensive teamwork available at this Medical Center and we are quite pleased with the quality of the program offered."

The Diagnosis

Rheumatoid arthritis is not absolutely diagnosable on the basis of laboratory findings. However, there is an antibody (substances produced as a part of the body's immune response to fight invaders), called the "rheumatoid factor," in the blood of 75 percent of patients with rheumatoid arthritis. This factor interacts with substances in the patient's blood causing inflammation in the joints. Additional tests, a biopsy or examination of a piece of surgically excised synovial membrane (or fibroid nodule if any exist), or a sample of the synovial fluid may add needed information. However, the actual, final diagnosis is made through a step-by-step exclusion of other conditions that can act like rheumatoid arthritis. This sleuthing is coupled with a recognition of certain characteristic symptoms common to all sufferers:

Arthritic hands: The swollen joints are mute testimony to pain and suffering

- Persistent inflammation (redness, swelling, pain, heat) of the small joints of the hands and feet;
- Stiffness in the morning, lasting an hour or more;
- Jelling—stiffness after a single position is held for a considerable time;
- Symmetrical patterns of joint involvement: both ankles, or the third fingers of both hands;
- Symptoms persisting for more than six weeks;
- Fibrous nodules (lumps) appearing near the elbows;
- Thickening of the synovium (membranes) of inflamed joints, with an increase of synovial (lubricating) fluid.

As the possibility of rheumatoid arthritis develops, several diagnostic tests are carried out. A full examination will establish the systemic presence of the disease and troubled joints can be x-rayed. In the laboratory, the blood is tested for several telltale signs that aid in determining the final diagnosis.

Positive diagnosis of r.a. is most difficult in the earliest stages. Here the symptoms can easily be blamed on a number of other things as a slight muscle strain or the flu. Conversely, a sufferer, like Sharon, who suspects the true diagnosis and fears it, may refuse to see a physician out of a normal, if unrealistic desire to deny the existence of the disease.

Unfortunately, delay in seeing a specialist simply increases the likelihood of damage to the joints. But the doctors are sympathetic with patients. As Dr. Barton says, "One of the most mportant things a rheumatologist has to do for his patients is to help give them a sense of optimism—not false hope but optimism—about life and their future."

What is Arthritis?

There are hundreds of varying conditions grouped under the general heading arthritis. All of them apply to pain in the joints and connective tissues, and the disease can occur anywhere in the musculo-skeletal structure.

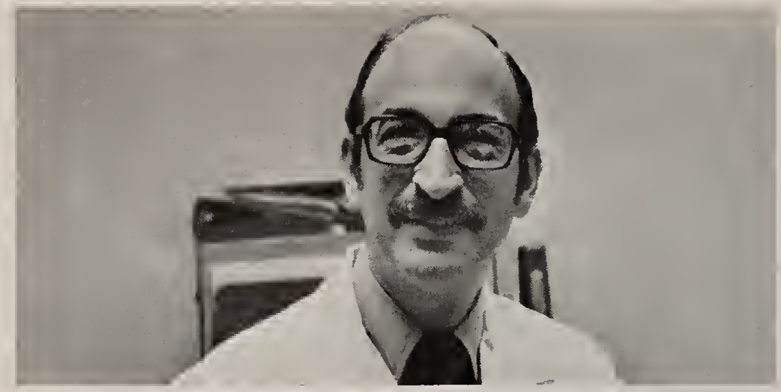
The various forms of arthritis comprise one of the major causes of physical disability in the United States, it is estimated that it afflicts over 17 million Americans.

Arthritis was first defined by Hippocrates in 500 B.C. Old timers recognized it as "rheumatiz," and it came into its own therapeutically after World War II. Due to the newness of the specialty, the old-time approach to rheumatiz is fairly common, and young people, like Sharon, still believe that the ultimate course has to lead to dependence on canes or confinement to wheelchairs. Actually, advances in treatment can make a victim's life relatively normal.

The classic symptom, inflammation, which appears as heat, swelling, redness, and pain, is a reaction either to infection or to foreign matter that is damaging the joint tissue. But this symptom can also be caused by some change within the body that causes damage to the tissues.

The most common form of arthritis—not the kind that Sharon has—is osteoarthritis, more accurately called degenerative joint disease. This disease is a wearing-out of the smooth lining of the joint. If affects all adults to some degree by late middle age, and in advanced stages the tissues may be worn away until the bone ends are grinding together. Degenerative joint disease can also occur in younger persons, but here it is usually a result of misalignment or injury from trauma or other disease. Though any area may be affected, osteoarthritis mainly affects the major weight-bearing joints, as hip and knee, and the spinal joints. There is rarely much systemic (or total body) involvement. Ten million Americans are sufficiently disabled from this form of the disease to lose time from their normal occupations. Over 200 thousand Americans are total invalids from osteoarthritis.

Sharon's type of arthritis, rheumatoid, affects 5 million persons and is particularly debilitating in that it does involve the whole system. Within the joints, the inflammation begins in what is called the synovial membrane, part of the sac that encloses the joint capsule, where a viscous, lubricating fluid is secreted. This inflammation may later spread to other parts of the joint



Paul Glickman, M.D.

system, including the cartilage and bone. It can affect the surrounding ligaments and tendons where synovia—the fluid—is also secreted, and it again causes progressive damage.

The Patient

"Look at me! I'm only 32 years old, but look at me! I'm five foot six and I weigh 92 pounds.

"Oh, I've always been thin, but my hands didn't always look like this. Four years ago we began to suspect rheumatoid arthritis. I suppose I knew all along; both of my grandparents had it. I remember the kind of pain my grandmother had, and how hideously her hands were bent . . . like mine.

"So I've run from it, pretending it doesn't exist, forcing myself to do more and more. I didn't want to be deformed, or to think I might end up in a wheelchair.

"I finally went to Dr. Barton a week ago. The pain was so intense that I couldn't even get in and out of a cab to go to work. My husband was tired of the denial. He sat me down and said, 'Okay, we've been trying it your way. You've forced yourself to do everything you always did, and its getting worse. I can't stand to see you in this much pain. Now we'll try it another way. We'll go to a specialist and see how you do with medical care and treatment.' I couldn't argue any more, and here I am. But what can I do with my life?"

This is a typical, angry reaction to a disease that is intrusive, painful, and debilitating. And, unfortunately, most victims are unaware of the great strides that have been made in treatment.

After three days in the hospital, Sharon was already benefitting from the rest and medication. She was beginning to enjoy physical therapy with whirlpool baths and heat treatments—but she was still angry:

"I suppose I should be grateful that I'm not permanently crippled, and that the kids are old enough to do a lot for themselves. But all of my freedom, all the things that make me me have been taken away by rheumatoid arthritis and it makes me furious!"

Most rheumatoid arthritis patients are admitted to Presbyterian-St. Luke's Hospital in the same condition as Sharon. They come as a last resort, finally forced by pain to confront the possibility of a severe problem. Some have worn themselves out with over-exertion, others with folk remedies. Often they have tried one or more of the hundreds of "wonder cures" ranging from the familiar copper bracelet to a magical series of shots, taken 20 days in a row—at $350 each—that are supposed to bring complete cure.

Physically, these magical mystery cures only delay proper treatment, and allow the disease to continue its damage. Their most insidious effect, however, is psychological—they hold out hope where there is none. Rheumatoid arthritis must be lived with. No amount of magic will make it go away.

Dr. Barton and others who have been treating patients with rheumatoid diseases insist that, "The most important thing a patient can learn is to fit life around the disease, instead of the other way around. The patient's entire lifestyle has to be changed, and this is the hardest thing to accept.

"Occasionally," he continues, "a patient can move in this direction in a couple of visits. A few people never can fully accept it. Yet there must be some acceptance before treatment can really begin. Treatment will only be effective if the patient goes along with the prescribed course of therapy after leaving the hospital or office."

For the newly diagnosed patient, a period of hospitalization is often most helpful. In addition to physical care, this situation gives the victim a chance to learn about the disease, and get to know others who have the same life problems.

"We need the kind of comprehensive teamwork available at this Medical Center and we are quite pleased with the quality of the program offered."
–Paul Glickman, M.D.

At Rush-Presbyterian-St. Luke's, psychologists Howard Feldman, Ph.D., and Marcia Pavlou, Ph.D., work closely with the specialists who treat the physical aspects of the disease. Drs. Feldman and Pavlou point out that, "One discipline alone can't begin to influence all areas of the arthritic's life. The disease affects the whole person." Psychologists go on hospital rounds (staff visits to the rooms) with the rheumatologists and orthopedists because patient/physician conversations often uncover adaptational problems that are amenable to psychological techniques.

Dr. Pavlou is familiar with the problems caused by chronic, incapacitating illnesses—she began her career by working with multiple sclerosis patients. "If any one of us had something like these diseases, we would have a great deal of difficulty adjusting. It doesn't mean there's a psychiatric disorder. It would be almost impossible to have rheumatoid arthritis and not need some kind of help with the adjustment."

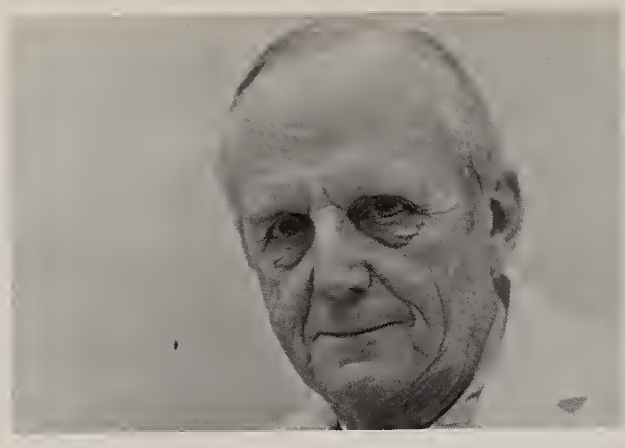
Again, Sharon is a typical example. She has been denying her disease for years, and she is very angry. Dr. Feldman says, "Feelings such as anger, helplessness, and resentment are natural parts of the adjustment process to chronic disease and as such must be accepted, clarified, and worked through. It may take a good deal of time for these feelings to be understood and, in fact, they may return with changes in the disease process and life situation."

"We feel," he continues, "that if we see the patients early in their hospitalization, they get to know us. Then, if an adjustment problem does come up, a patient doesn't have to think, 'Oh, my God, I must be crazy!' but rather can comfortably turn to one of us for help."

Dr. Pavlou, Dr. Feldman, and their colleagues in the Department of Psychology are now setting up a group program for r.a. patients. This program is based on group discussions directed towards education and adaptation and is designed primarily for the psychologically healthy individual undergoing the unusual long-term stress of rheumatoid arthritis. Dr. Feldman says, "Patients and their families most effectively cope with a stress they understand; ambiguity and lack of knowledge often lead to anxiety, discouragement, and decreased active coping. We have found that these groups provide an extremely effective setting in which to identify false information, clarify misconceptions, disseminate new information, and confront fears and anxieties about the disease."

Naturally, some patients require more than a group setting to deal with their arthritis. But psychologists have found, while working with other groups whose members are afflicted with a debilitating disease, that people of divergent social and educational backgrounds and ages can work together. The professionals expect the same success with their r.a. patients. "Newly diagnosed persons often feel very isolated, very alone," says Dr. Pavlou. "They may look quite normal so no one can understand how exhausted they feel and why they have to cut down on their activities. Dr. Feldman adds that many newly diagnosed patients are looking for models. They look for someone like them who is "making it". This understanding also gives the patient an added incentive for cooperating with treatment programs and for adopting techniques for self-care.

Dr. Feldman adds, "They can't change the way their body looks or the kinds of things they are physically able to do, but it is possible to change the way they think about it. If a young



Evan Barton, M.D.

woman who is a meticulous housekeeper has a serious flare-up of rheumatoid arthritis, and can no longer take care of her home, her self-image can't come from how clean she keeps the house. But she can, with the help of the group, see how much more valuable she can be to her family as a good companion."

The patient's relationships with family, friends, and co-workers are naturally affected, and these people often have their own problems: anger, denial, and over-solicitude. The arthritis-group members can make each other aware of what is happening in their close associations and help point out ways to educate those around them.

Dr. Feldman sums up the value of the group situation: "We've seen people come out of the first meeting saying, 'Gee, I never heard those things before.' They didn't hear them before because of their own emotional barriers. But identifying with others who have benefited gives the patient the courage to face that much more."

Medication

Though psychological difficulties may be shared by arthritis patients, the progress and manifestations of the disease are almost never duplicated, and each treatment program must be tailored to the individual. Still, there is a common starting point. "The kinds of things that are basic to treatment are part of the litany I've repeated to patients so often I sound like a broken record," Dr. Barton says. "Total body rest, local rest for the inflamed part (perhaps with splinting), physical therapy with heat treatment, and aspirin. These are essential." Where extended therapy is required, several drugs may be tried, in varying doses, and the tolerance of the patient, along with the degree of progress, is measured until the best combinations are found.

But the real wonder drug, in treating r.a., is aspirin. It hardly seems likely that anything so familiar (and so inexpensive) could control a major, chronic disease, but it does. For the arthritic, aspirin provides relief of pain, control of fever, and suppression of inflammation.

It is prescribed primarily for its anti-inflammatory effect, so the pain relief is really a bonus. Sharon found out about this kind of relief while she was in the hospital. Dr. Barton established a proper dosage, for this stage in her illness, for maximum benefit and minimum patient stress. Relief requires a high level of aspirin in the system, and since individual absorption rates vary, it is not unusual for these patients to take between 12 and 18 aspirins a day. The drug, in the recommended dosage, must be taken every day fc maximum benefit, whether or not ther is pain or evidence of inflammatior There is great temptation to ignore th medication during periods of remission, but abandoning the aspirin whe pain is not present usually will spee its return.

Aspirin, though in this case "a wo der drug," is not a perfect one. "Th gastrointestinal specialists hate aspirin," Dr. Barton says. "It can produc ulcers, it tends to irritate the stomac and it may increase a patient's tendency to bleed. In those who alreac have ulcers, this can really be a problem.

"But there is no drug used by u that doesn't have its undesirable effects. We rheumatologists just have t say, 'Yes, we recognize these problems and we'll try to control them because the beneficial aspects are necessary for our patients."

And for those who do not respond "For 50 percent of these patients, th basic program of rest, aspirin, an physical therapy brings satisfacto control," Dr. Barton says. Within

> *"One of the most important things a rheumatologist has to do for his patients is to give them a sense of optimism."*
> *–Evan Barton, M.D.*

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reasonable length of time, the rheumatologist can determine if the patient is responding to this approach or if other measures must be taken."

There are alternatives. For instance, intramuscular injections of gold salts, in small doses, weekly, over a period of time, are often effective. Physicians are not quite sure why they work, but gold shots almost invariably reduce inflammation. The use of gold treatment must be carefully monitored, however, and at the first sign of skin rash or evidence of protein in the urine, the treatment must be reconsidered and possibly stopped.

The drug phenylbutazone has much the same effect as aspirin in checking the rheumatoid processes, but is somewhat more dangerous. Because it may cause fluid retention and swelling (edema); gastric irritation; and occasionally severe skin, kidney, or blood cell reactions, it is usually used only for short periods, as during flare-ups.

Indomethacin is similarly useful to reduce pain and inflammation, but is less predictable than phenylbutazone, and can cause headaches as well as gastric irritation.

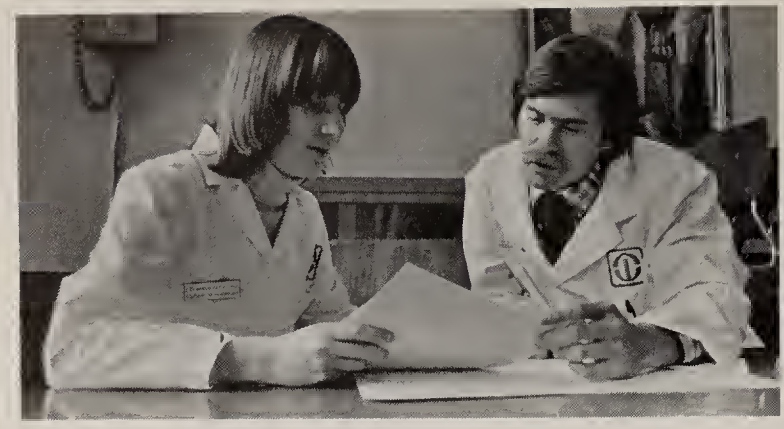
Anti-malarial drugs as chloroquin and hydroxychloroquin are absorbed by connective tissue cells and are sometimes very effective anti-rheumatics. Unfortunately, they do not produce results for some time. They are not as effective as gold, and they are more dangerous than the other drugs more commonly utilized. Adverse effects sometimes include serious eye problems.

By far, the most powerful of the anti-inflammatory agents are the corticosteroids, including cortisone—the one most often used to treat r.a.—but their undesirable effects can be equally powerful. "We will use steroids only when we are almost at the end of the line," says Dr. Barton, "when a patient has not responded to simpler measures. We use them in situations where the patient has a social situation where daily performance is necessary, as a wage-earner or a homemaker with small children. The ideal treatment would probably be to place the patient in a hospital for a prolonged period, away from stress, with physical therapy and other measures every day, but this is impossible. So we compromise. We must continually be aware that we are compromising, and it is imperative for the patient to be fully aware of the risks involved before steroid therapy is begun."

When the steroids were developed in the late forties, they were greeted with unqualified enthusiasm, and it was some time before their potentially disastrous side effects became apparent. Steroids can be extremely beneficial, particularly during flare-ups, for many patients, but the negative effects can sometimes overshadow the positive ones. The well-known "moon face" appearance may be accompanied by loss of hair from the scalp while growth increases elsewhere, the carbohydrate metabolism may distort in the direction of diabetes, female hormone production may change, and thinning of the bones (osteoporosis) appear.

Endocrinologist Will G. Ryan, M.D., senior attending physician and associate professor of internal medicine, is often called in as a consultant when steroids have been used to treat r.a. "The undesirable results of the steroids are a factor of the amount taken—what we call dosage dependent," he points out. "A patient with a severe attack of rheumatoid arthritis needs a dosage of steroids high enough to combat the inflammation. Once it starts to subside, however, the dosage must be decreased, very slowly, so that an adrenal crisis (a problematic effect of rapid withdrawal) does not occur.

"Steroids seem to take the calcium from the bones, leaving them spongy and far less resistant to fractures and deformities," Dr. Ryan says. "To stop



Marcia Pavlou, Ph.D. and Howard Feldman, Ph.D.

the osteoporosis and strengthen the bones in these patients, we have found it very beneficial to use a combination of sodium fluoride, vitamin D, and calcium. The trouble is that while osteoporosis is very slow to develop, it seems slower to improve.

"I also work on the management of the diabetogenic (tendency toward diabetes) effect that steroids cause. Insulin is used for steroid induced diabetes, and, with improvement, dosages are lowered along with the steroid dosages. Eventually it is usually discontinued. However," Dr. Ryan explains, "while it's true a patient will occasionally remain diabetic even when no longer on steroids, in this patient, the tendency toward diabetes was likely a pre-existing condition.

"It is important to proceed very slowly in decreasing steroid dosage. These drugs suppress the action of the adrenal gland and it has to be phased back into normal function very carefully."

Dr. Ryan looks forward to a time when his own role in the treatment of rheumatoid arthritis will also be decreased. "I certainly hope that steroids without these destructive metabolic effects will soon be developed. In the meantime, we'll continue to use them very conservatively."

Learning How to Best Use the Joints

One of the bright spots in Sharon's days at the Medical Center was the time she spent in Physical Therapy. Here she soothed her aching hands and relaxed in the flow of the whirlpool. Eleanor Stupka, R.P.T., chief physical therapist, explains: "A patient usually gets to us in pain and with multiple joint involvement. First we want to relieve that pain, and then we move on to methods of preventing deformity, strengthening muscles, and correcting existing deformities caused by muscle contraction.

"We begin with heat treatments to relieve the pain. During a flare-up, exercise must be kept at a minimum to prevent further damage to the joints. At the start, rest is as important as medication."

Multiple joint inflammation is treated through heat or hydrotherapy, in whirlpool baths. A "low boy" is available for patients with pain in the lower joints and a Hubbard tank accommodates the whole body. A water temperature of 98° to 102° F provides comforting relief for inflamed joints.

A big plus in heat treatment is that it can be carried on at home. Occasionally a patient will respond better to cold than to heat.

Once the pain subsides and the inflammation is calmed, the patient is taught an exercise program that is to be carried out at home, on a daily basis. "This is the most important part of the treatment," Ms. Stupka says. "Naturally, it involves more than demonstrating exercises. We have to educate our patients, explain why an exercise is beneficial, what effect it has on the joints, and what can happen to the joints if it isn't done.

"The most comfortable position for the patient can be the most damaging, such as flexing the elbows and keeping the arms close to the body, or bending the wrist downward. We show them the best resting positions for their condition.

"Sharon, for instance, would come here and really work. She'd spend some time in the whirlpool to relax her knee and foot joints and then put a lot of effort into practicing the range of motion exercises. But when she took a few minutes out for a break, she'd have to be reminded of the best positions for her.

"Each patient requires an individually prescribed set of exercises. Each joint is taken through a full 10 times. This is enough to maintain range of motion and strength."

"One discipline alone can't begin to influence all areas of the arthritic's life. The disease affects the whole person."

–Howard Feldman, Ph.D.
Marcia Pavlou, Ph.D.

The patient must work out a balance of rest and exercise. There may be some pain for a couple of hours after doing the exercises, but if it persists into the next day, the person has overdone, and should cut back," she explains.

Once the pain is gone, the prescribed exercises, like the prescribed aspirin, may fall by the wayside until the next flare-up occurs. Physical therapists, who prefer not to have their admonitions reinforced by pain, do their best to develop good exercise habits in their daily sessions with inpatients in the hope that they will carry the practice home with them.

Though the physical therapy area has a distinctively gym-like atmosphere, the therapists are considerably more than gym-teachers. At any given moment they may be called upon to act as psychologists, parents, adversaries, or friends. A patient, like Sharon, going through emotional as well as physical turmoil requires a great deal of both sympathy and prodding. "But it's a source of great joy for us," says Ms. Stupka, "when our patients can really learn to feel independent."

Surgical Intervention

The years of neglect had so damaged Sharon's hands, that Dr. Barton thought she might benefit from surgery, and called in an orthopedic surgeon. Sharon understood that this would not be a cure. But it can, in many cases, help to improve the patient's appearance and relieve pain. Francis M. Howard, M.D., associate professor and associate attending surgeon, has worked with rheumatoid arthritis patients for years and he performed the operation on Sharon's hands. First he explained why surgery was necessary:

"These joints have muscles and tendons pulling across them to keep them in position. Rheumatoid arthritis destroys the joint mechanism by actually eroding the joint, and when the erosion takes place, the tendons pull differently, and cause further deformity. In the hand, for example, the distortion may cause the tendons to slip off the center axis of the joint to the ulnar side (opposite the thumb) causing the ulnar deviation or misshapen fingers we so frequently see in r.a. patients. The tendon rarely slips to the radial or thumb side."

Sharon not only had an ulnar deviation but she had also lost the sense of touch in her hand because the diseased synovium had damaged the nerve in her wrist. Through surgery, Dr. Howard was able to relieve the choking of the nerve and, at the same time, reroute the tendon at the base of her thumb to neutralize the deforming force.

"Sharon seems to be much improved in her whole outlook on her disease," he said later. "She is using the same creativity she has always had to rearrange her life, and she is going to be able to overcome her problems."

Bowing of the knees, causing them to bend inward, called the varus deformity, is another example of a typical arthritis problem. Here, the disease erodes the medial, or inner, aspect of the knee joint, then the muscular tendon unit pulls across to make matters worse.

"When operating, the surgeon must take care of the joint itself, with synovectomy (removal of synovial membrane material) or joint replacement, and he must correct the muscle-tendon pull at the same time," Dr. Howard says.

Occasionally, a flare-up of a single, diseased joint can be treated with synovectomy with no recurrence; in other patients the synovium again becomes inflamed and another synovectomy is required. Dr. Howard says, "In the most serious cases, over a long period of time, a patient may require numerous surgical procedures."

The highly useful technique of joint replacement has been developed over the last 15 years. Now in the third or

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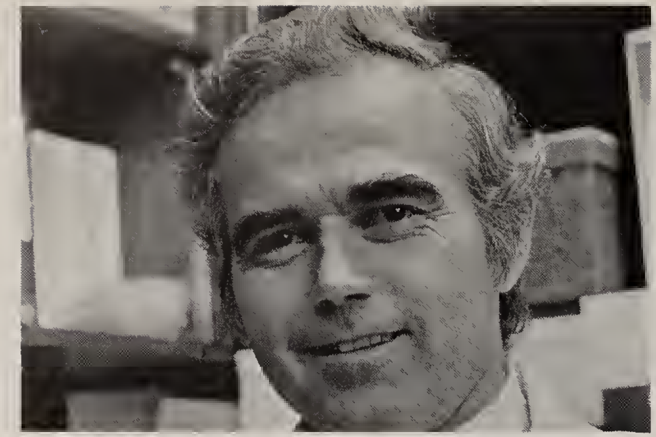


Will Ryan, M.D.

In rheumatoid arthritis, the synovial membrane becomes greatly thickened and contains collections of cells derived from the white cells of the blood—namely, lymphocytes and plasma cells. As the disease process advances, masses of inflammatory tissue extend within the joint and begin to creep over the smooth surfaces of the articular cartilage that lines the bone ends.

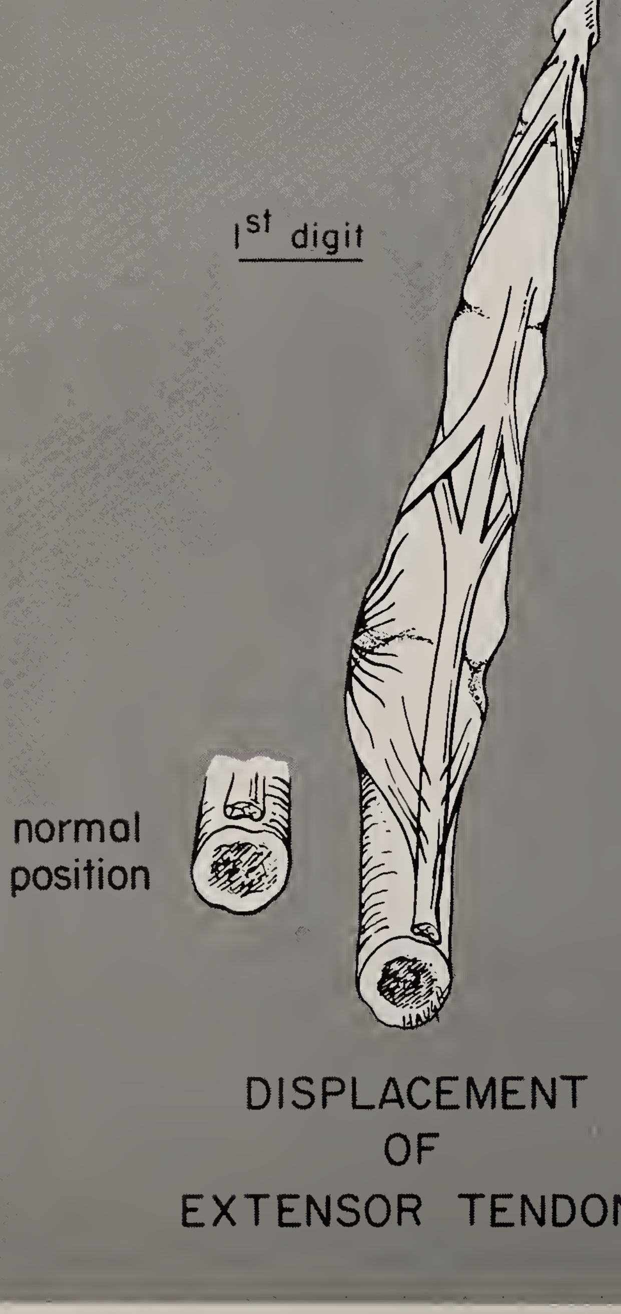
This inflammatory tissue, called pannus, gradually causes erosion and thinning of the cartilage. Later, the exposed bone ends may become pitted and eroded, or penetrated by cystic or saclike cavities. However, this condition is typical of the fully established disease. With proper diagnosis and treatment, these serious consequences may be lessened.

All types of arthritis involve the joints and accompanying tissue structures. Most joints in the body are gliding or diarthroida, wherein the opposing surfaces move freely. They are also called synovial joints, as they contain synovial membranes that secrete the lubricating fluid, synovia.

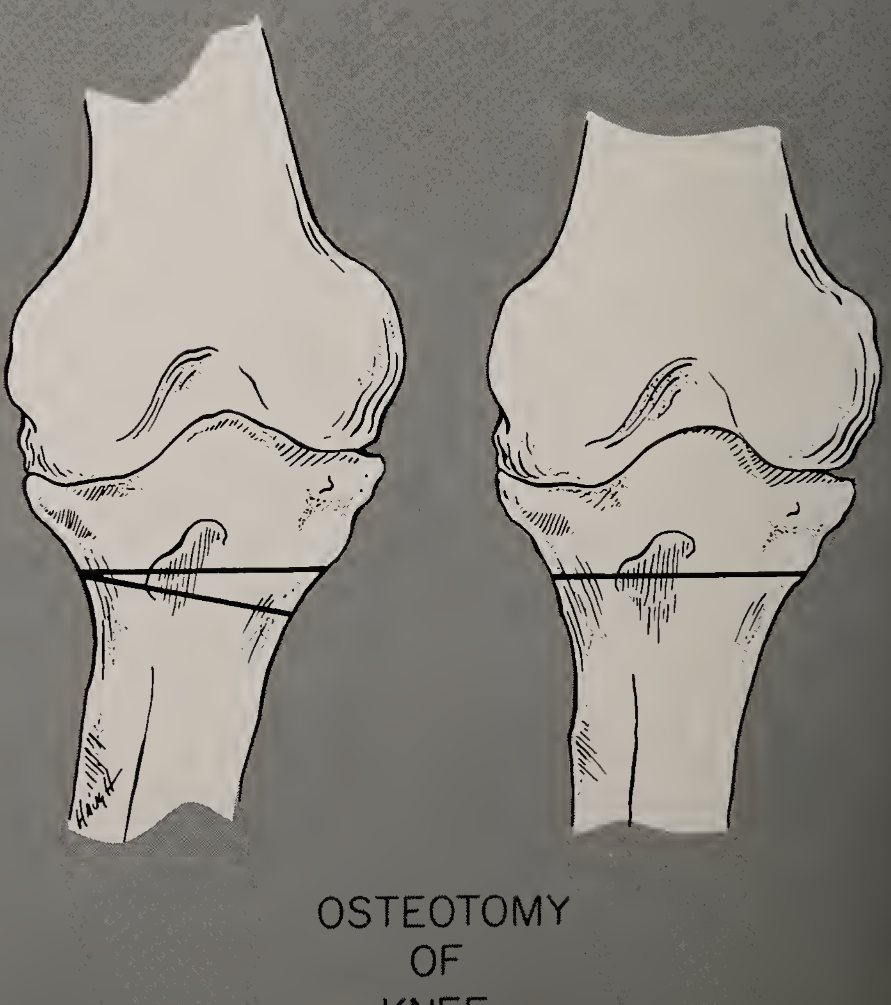
On this page, see an example of a normal joint and its supportive tissue components and a glossary of terms:

Articular cartilage: This flexible, slippery lining covers the opposed bone surfaces. It is composed of collagen (protein) fibers and a chemical substance. This layer has blood vessels only at its base, and the living cells are nourished by synovial fluid.

In rheumatoid arthritis, the synovial membrane becomes greatly thickened and contains collections of cells derived from the white cells of the blood — namely, lymphocytes and plasma



DISPLACEMENT
OF
EXTENSOR TENDON



OSTEOTOMY
OF
KNEE

> *"A patient with a severe attack of rheumatoid arthritis needs a dosage of steroids high enough to combat the inflammation."*
> *–Will Ryan, M.D.*

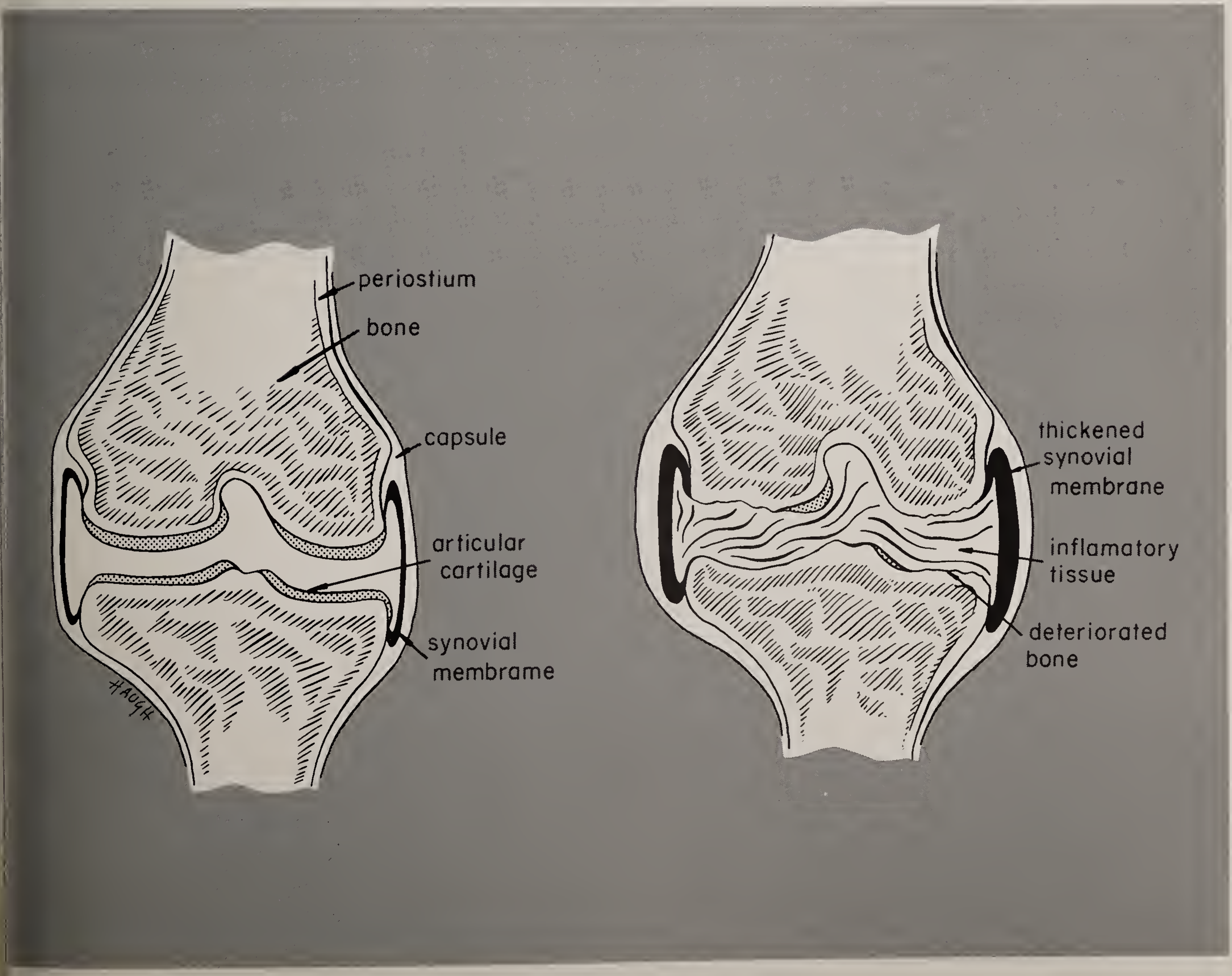
cells. As the disease process advances, masses of inflammatory tissue extend within the joint and begin to creep over the smooth surfaces of the articular cartilage that lines the bone ends.

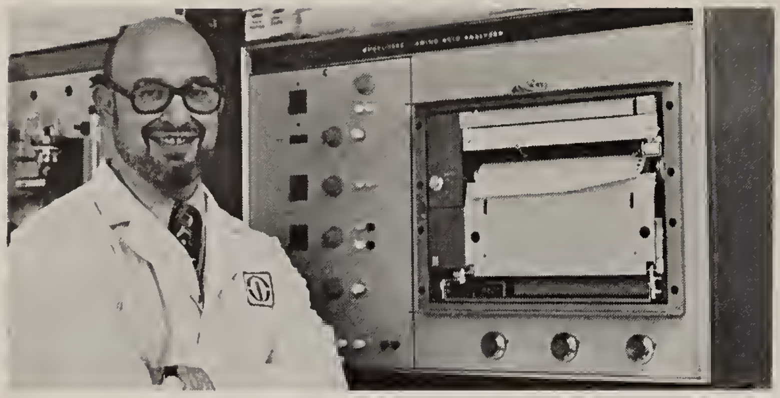
This inflammatory tissue, called pannus, gradually causes erosion and thinning of the cartilage. Later, the exposed bone ends may become pitted and eroded, or penetrated by cystic or saclike cavities. However, this condition is typical of the fully established disease. With proper diagnosis and treatment, these serious consequences may be avoided.

Synovial membrane: Forming a continuous band with articular cartilage, they totally enclose the joint. This membrane lines the sides of the joints and secretes synovial fluid.

Synovial fluid: The viscous secretion produced by synovial membrane cells to lubricate the joint and to provide nourishment for the cells in the articular cartilage.

The capsule: A tough membrane composed of fibrous tissue, it forms the outer envelope of the joint. This sac-like structure is inelastic and prevents excessive movement of the joint by becoming taut at the extremes of the range. The nerves of the capsule alert the overlying muscles to contract in the event of potentially harmful stretch. This function is helped by the ligaments or accessory bands of tissue that lie outside the capsule and prevent movement of the joint beyond its normal range.





Henry Gewurz, M.D.

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fourth generation of development, polyethylene prostheses have taken the place of the earlier metal models. These new substances are pliable enough to allow an effective, if not completely normal range of motion. However there is still some bone damage at points of attachment, and at Rush-Presbyterian-St. Luke's researchers are seeking further improvements.

Joint replacements are most effective in knees, hips, hands, and feet. In other joints as elbows, shoulders, and ankles, replacements are less effective because of the structure of the joint.

Occasionally a surgeon will recommend osteotomy, the cutting and removal of bone. Where joint erosion is uneven, as in the varus deformity of the knee, removal of a small wedge of the bone may correct faulty alignment by distributing the weight-bearing thrust more evenly on both halves of the joint.

Dr. Howard also notes the usefulness, in special cases, of arthrodesis, a procedure by which a joint is fused and its motion stopped so that the problem is permanently eliminated. This is possible in joints of the toes, the foot, the ankles, and the spine, because fusion does not cause appreciable impairment of activity. He describes the first such case to confront him:

"About 10 years ago a patient came to me because her eyes were not focusing and she was having a great deal of difficulty walking up a few stairs. She had had r.a. for about 10 years, but at first these complaints seemed unrelated to the disease.

"Then we discovered that through a series of arthritis caused problems her cervical spine slipped forward and caused pressure on the spinal cord. If it was not eased, it could cause paralysis, or even death.

"It was an unusual case and we had never done an arthrodesis like that here, but a colleague of mine in Ann Arbor, Michigan had just published his experience in a similar case. So we took our patient to Ann Arbor; her cervical spine was fused, and the compression on the spinal cord was relieved." Dr. Howard has since improved on the procedure and a number of patients at Rush-Presbyterian-St. Luke's can now benefit from this treatment.

Learning to Live with Arthritis

After two weeks in the hospital, Sharon was considerably happier. "I feel so much better, it's as if I'd been issued a new body!" she said. Her aspirin level was established, she had been to physical therapy daily, and she and Dr. Barton had discussed the possible use of gold injections for continuing management. She was prepared to face the surgery necessary to give her more use of her hands, and she had talked privately with the psychologist, Dr. Pavlou, and had attended several group discussion meetings.

But she still had a long way to go. "I realize, at least intellectually," she continued, "that I have to reorganize my life around r.a. and that the big difference in how I feel will depend on how I deal with it. But emotionally, I still get awfully depressed sometimes. I'm learning to take one day at a time, though, and that does make everything a little more bearable. Oh, but please excuse me, I'm late to class."

Then she was off to Occupational Therapy. There she was learning how best to use and protect her pain-weary joints. Medical Center rheumatologists usually prescribe an extra three-hour class with the occupational therapist at the end of the hospital stay. It not only serves as a kind of debriefing session before the return to daily life and all its physical stresses, but it also reinforces the group experiences in psychology.

The occupational therapist (o.t.) is part of the team from the beginning of the in-hospital treatment and makes a two-part evaluation of the patient. Cathy Brady, O.T.R., director of Occupational Therapy at the Medical Center, describes what happens.

"We look first at their functional ability to use their hands in self-care, but we can't just say, 'Can they or can they not do a specific thing?' Instead,

> *"If you look at the inflamed joints and the immunological changes characteristic of rheumatoid arthritis, you see distinct changes in the patient's total immune response."*
>
> *–Henry Gewurz, M.D.*

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we have to ask, 'Is there pain? How long does the pain last?' Then we can plan different patterns of movement for the patient, or if necessary suggest assistive devices.

"That brings up another problem. Some people don't mind going around with five or six things like a key holder or a reacher dangling from their belt, but there are also patients whose 'gadget tolerance' is very low. We must determine the approach individually.

"The other part of our evaluation is a physical assessment of the patient's hands. After an examination and a discussion of their condition with the physician, we ask the patient about how they would normally use their hands every day. This helps us to determine which patterns of movement need to be emphasized."

Sometimes a patient will benefit from a resting splint, which is anatomically designed to hold the wrist at 30° of extension, the least stressful position for the hand. The o.t. may suggest splinting one wrist one night, the other the next. Other joints may also benefit from splinting. The goal of splints and other supportive devices and techniques of movement is to reduce stress wherever possible—not an easy matter when the external stress of daily activities is complicated by the internal stress of the disease."

In the class that Sharon attended, Ms. Brady and her staff explained the basics of body mechanics, joint protection, and alternative patterns of movement. It is a measure of Sharon's improvement that her rheumatologist prescribed the class. The "students" are screened to eliminate those patients who are not yet ready, emotionally, to deal with the realities of rheumatoid arthritis.

The typical class includes four to six people who have already been working with the occupational therapist during their time in-hospital. The patients introduce themselves and talk briefly about how long they've had r.a., and what their lifestyle requires in terms of specific activities. The session is informal and the size allows plenty of interaction. Ms. Brady describes a typical, helpful interchange.

"One really lovely young woman was very upset because she had to depend on her husband to wash her hair for her. She was expressing her frustration with great emotion and it was pretty tense. Then a tough construction worker next to her said, very thoughtfully, 'You know, the person we should really feel sorry for is Jackie Onassis. She has to send all the way to Paris to get a guy in to do her hair!'

"The wife laughed just as hard as the rest of us, and she was then able to listen to realistic suggestions about how to deal with that problem."

In the class, Ms. Brady uses laymen's terms to describe the anatomy of the joints of the hands, illustrates her points with schematic drawings and descriptions and also explains the thousands of stresses hands undergo every day. The students explore alternative methods of using the principles of body mechanics to do what has to be done. A man who has to grip tools most of the day to earn a living, learns how to pad the handles so gripping is not so stressful; an accountant who must sit in her chair for long periods learns the proper posture to reduce stress on the joints. Ms. Brady says, "The main thing is not to introduce a lot of 'must nots' and 'cannots.' The patients need positive ways to restructure their lives.

"One most important point I try to make is the basic principle of joint protection: Always use the strongest or the largest joint possible to do any task. Instead of using the fingers, use the wrist. Instead of using the wrist, use the elbow. Instead of using the elbow, use the shoulder. Instead of grabbing a purse handle with your hand, carry it over the wrist or, better yet, over the elbow."

Frances M. Howard, M.D.

Occupational Therapy provides each patient with a packet of information on hand protection, exercises, body mechanics, and stress reduction, but almost every session produces some new, creative ways of dealing with everyday situations. It also produces an outpouring of feelings, touching upon the psychological pain of dealing with an exhausting and often agonizing disease. Ms. Brady is delighted that the Psychology Department has begun the group program, since o.t. groups cannot deal with the wide range of emotional problems. She focuses on her own specialized goals: "We must encourage the patients to think specifically about how they are using their joints and how to use them more effectively to maintain their independence. If a person has 5,000 stresses a day on the hands, maybe we can offer ways to reduce that to 3,000. That's 40 percent less than before, and that can be very significant for someone with rheumatoid arthritis."

Seeking the Cause

In the basic science laboratories, immunologists and microbiologists are working with orthopedic surgeons to track down the cellular and subcellular changes that bring on rheumatoid arthritis.

Henry Gewurz, M.D., the Thomas J. Coogan, Sr., Chairman of Immunology, explains the work: "If you look at the inflamed joints and the immunological changes characteristic of rheumatoid arthritis, you see distinct changes in their immune response as well as decreased levels of complement in fluids drained out of the joints. Complement is a complex of proteins in blood and lymph that acts with immune bodies to destroy bacteria and aids in clearing away foreign materials from the body. This system contains at least 15 different enzymes, some of which have been activated as a result of the disease.

"We're trying to find out the diverse ways complement becomes activated, so that we can learn to control the reaction. We're particularly interested in how complement relates to C-reactive protein, a substance that is present in the blood of each healthy person in trace amounts but increases substantially when a person becomes ill. Of interest is that C-reactive protein can activate the complement system as part of the inflammatory process. Further, it can inhibit the activity of certain immune cells and the ability of blood platelets to initiate and participate in clotting reactions.

"We've been studying this for more than three years," Dr. Gewurz says. "We are trying to establish whether the C-reactive role is to clear away damaged tissue and to help in the repair process, or whether it's a case of the body turning on itself. But, since it's always there when there is an inflammation, as in rheumatoid arthritis, we're convinced it's a factor that must be dealt with."

Attacking the problem of rheumatoid arthritis from still another direction, Medical Center microbiologists are testing the possibility that some forms of rheumatoid arthritis may be caused by a persistent, latent (inactive) infection from rubella (german measles) virus. David Peterson, Ph.D., assistant professor and assistant scientist, and Robert Patterson, M.S. are working with Microbiology chairman Friedrich Deinhardt, M.D., and Dr. Howard of orthopedic surgery in evaluating the hypothesis. Dr. Peterson says, "Earlier in our investigations, when we were questioning whether rheumatoid arthritis might be caused by infectious agents, it was suggested that arthritis was associated with viruses known to cause persistent infections. One of them was rubella virus."

In preliminary studies, in a small sample of rheumatoid patients, antibodies to rubella virus were significantly higher than in a control group, even though the actual incidence of exposure to German measles would have been the same. Cytotoxicity (poisoning) tests using antiserum to rubella virus, specifically damaged rheumatoid-arthritis synovial cells but not normal synovial cells. Dr. Peterson is encouraged by the results; "I think it's quite reasonable," he says, "to imply that the response here may be associated with arthritis."

"In the most serious cases, over a long period of time, a patient may require numerous surgical procedures."
–Francis M. Howard, M.D.

Replacing damaged joints

The Chairman of the department of Orthopedic Surgery, Jorge Galante, M.D., heads a team of researchers from his own and other departments who are studying available prostheses to determine how current designs and materials wear, and are developing improved materials for substitute joints.

The Gait Laboratory, which Dr. Galante directs is, literally, set up to do computerized study of human gait as in the stresses involved in normal walking and movement patterns. There are, for instance, some 15 different kinds of knee prostheses. These laboratory data are designed to help the orthopedic surgeon choose the best model of artificial jont for each patient.

Though there are other gait laboratories in the country, few are as automated as the one at Rush-Presbyterian-St. Luke's which has, for instance, the only optoelectronic camera in the country. This camera can record displacement of body and limb segments.

The lab itself centers on a 30-foot walkway raised several inches off the floor and surrounded by a metal framework. Here, the measuring is done and all the various devices feed the information directly into a computer, which draws a mathematical picture of the relationships among them. Thomas Andriacchi, Ph.D., assistant professor of biomedical engineering and orthopedic surgery, is developing computer models of gait which will help to pinpoint both experimental and analytical approaches to the most important variables.

Artificial hips have only been in use for about 10 years, and artificial knee joints a little less than 5 years, so the long-term data are still incomplete. "One of the things we are trying to find out is how much stress the metal can take, the fatigue life of the various alloys used in total joint replacements," Dr. Galante said. "Then we must get to the other side of the equation: how much stress the prosthesis will be subjected to in use."

Besides wear and fatigue, there is the design of the prosthesis to consider. Dr. Andriacchi has been using the computer to analyze why the devices break; how the stresses are distributed over bone, cement, and prosthesis; and what would be required to prevent damage. Using these data, the orthopedic and biomedical engineering researchers have developed porous rods made from titanium, which may be used in conjunction with artificial joints to promote growth of bone into the material to provide extra support. Results in laboratory animals have so far been excellent.

"Trying to duplicate the joints you were born with is difficult. We've only made a beginning," Dr. Galante said. "It may never be possible to replace every joint in a person's body, but it is possible to relieve a great deal of suffering and broaden the scope of many people's lives. We're trying to find out as much as we possibly can about how people move, so that we can design artificial joints that are responsive to the needs of the people who will use them."

Making the Difference

The search for better treatment, and perhaps a cure for arthritis will yield relief for millions of sufferers. In the meantime, help and therapy is a reality. As Sharon Barnes says, "When I came here, I had almost no hope and little help. I could only envision a lifelong role as a dependent cripple.

"My stay at Rush-Presbyterian-St. Luke's, under the care of Dr. Barton who explained the treatment pattern; with the psychologists who helped me to accept and function with my disease; the chance to think and relax in the whirlpool baths; and to exercise as the therapists taught me; has made the difference between just surviving and living my life to the fullest." ⊕

Rush Medical College Chooses Four-Year Curriculum:

By William F. Hejna, M.D.

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Medical school curricula have undergone significant methodological changes during the past 10 years, prompted by such factors as social demand, technological development, and fiscal pressure. Among those changes is a trend toward shortening the time from high-school graduation to starting practice: This is most usually accomplished by accelerating the rate at which students are expected to learn the medical school portion of that continuum. About 50 schools have regular or optional three-year curricula. Some have an accelerated premedical/medical school program of six years.

Rush Medical College of Chicago recently reversed this trend by changing its regular three-year program to the more standard four-year format. The reasoning behind this move deserves comment. Further, the intensely dynamic sociopolitical climate in which medical education exists during the current decade justifies repeated review of the validity for moving in the direction of shortened curriculum.

Rush Medical College was chartered in 1837 and produced some 10,500 physicians by 1942. It then confined its programs for 27 years to graduate medical education and upper-level undergraduate education, reactivating its full medical school charter in 1969. A first-year class of 60 and a third-year class of 20 were admitted in 1970 and 1971, and two classes have since graduated. The graduating class in June 1975 numbered 85, and the entering class size for 1975-76 is 110. It is important to note that Rush reopened basically as a three-year school with an "innovative" curriculum utilizing more sophisticated technology, all interdisciplinary task force teaching modes, and a greater emphasis on behavioral science and early patient contact.

Several forces were primary in the movement toward shortened curricula during the late 1960s and early 1970s. For example, widespread dissatisfaction with the nonavailability of physicians and general discontent with the health care provision system manifested itself in a variety of ways. The Campbell Report (Campbell, J.A., Tucker, W.R., Turner, I.R. *Education in the Health Fields for the State of Illinois.* Chicago State of Illinois Board of Higher Education, 1968.), which was endorsed by the Illinois State Legislature, documented physician shortages in that state, and the Carnegie Foundation Report *(Higher Education and the Nation's Health: Policies for Medical and Dental Education* . . . New York, McGraw-Hill Book Co., Inc., 1970) indicated national shortages. Subsequently, in 1970 the Congress passed the Health Manpower Training Act, which served as a "general educational support grant" to the medical colleges and encouraged increased enrollment levels. The resultant universal expansion among entering medical school classes and the increase in the number of schools from 98 in 1968 to the present 114 caused an increase in first-year students from 9,000 to 15,000. It must be recognized that this will also cause a significant increase in the number of physicians practicing in the United States.

Other results of the perceived physician shortage have been a sharp upswing in the immigration of foreign medical graduates, and programs whose impact is not yet entirely known, such as the Coordinated Transfer Application System (COTRANS) and "Fifth Pathway" mechanisms for retrieving Americans in foreign medical schools back to this country.

The three-year curriculum serves to increase the number of graduates by only one class each 12 years. Such increases do not compare favorably with those effected by the methods mentioned, and none addresses the more substantive issues of severe discipline and geographic maldistributions. The "doctor shortage" statistics of a decade ago do not appear to constitute a valid reason to maintain a three-year curriculum.

A second set of justifications for the three-year program revolves around fiscal aspects. The student's tuition, for example, appears to be less since the student pays for three years rather than four. It should be noted, however, that total tuition expense is the same if calculated by the quarter, since three-year curricula generally represent a compression of the 12-quarter course by eliminating the summer-quarter vacation. With respect to student financial aid, the outlay of funds is less in the three-year program; student loan funds can be used more effectively if the school concentrates these funds in the first two years and encourages commercial lending in the upper years, when it is more available because the student is a lesser risk. Third, the three-year program cost to the school is theoretically less if one calculates cost per head, per year and subtracts tuition, capitation, and endowment income. It must be realized

William F. Hejna, M.D.

in such an exercise that a full clinical faculty complement is necessary on a continuing basis regardless of how long each student is in school, and further, that the clinical faculty is generous in volunteering teaching time during the fourth year, particularly in the private sector. The cost per student factor thus holds only if basic science faculty is actually reduced in size when the three-year program is adopted.

A major element in design of the three-year curriculum is the qualitative aspect of content. This bears critically on certain questions: What is the intended product? What is the responsibility for competence and protection of the public? What is the educational quality control mechanism? And how are the needs of the students as individuals met? The answers to such questions are difficult to quantify or to resolve by subjective value judgement; nevertheless, some presumptions may be agreed on.

For example, clearly, the body of fundamental biomedical science continues to increase, and just as clearly, the physician must understand with considerable depth both morphology and its function. Charges of dehumanization and anti-intellectualism have been leveled in the scientific field. Irrelevancy and duplication are used as arguments against the need for replication of physician scientists, or even against teaching physician "users" about biomedical research. Irrespective of these sharp differences, it is more difficult for the student to assimilate the expanding scientific material in a shortened period of time.

Second, the behavioral sciences have taken on a new importance and time need in the curriculum, and the colleges must also assume responsibility for increased primary care experiences of various types for the student. The latter elements tend to erode the basic science time portion of the curriculum or the clinical elective time to a much greater extent if the overall duration of the curriculum is shorter.

Clearly, the flexibility necessary to respond to individual needs can best be met when the pressure of time for completion is less. Moreover, this flexibility must serve the principle of enrichment recognizing the broad spectrum of students' educational, social, and cultural backgrounds. Although the group as a whole is highly motivated and the quest for medical knowledge and experiences is intense, time is a critical requirement in learning to deal with these emotionally. Professional maturation is recognized as a slow process. At Rush, a highly structured faculty advisor program is designed to bring into focus various options the student may have in achieving his or her career goals. Time constraints represent the greatest impedance to exercising options and determining the applicability of what is learned.

The Rush experience with the three-year program found 55% of the students indicating a desire to finish in four years rather that the initially intended three; some confided a sense of guilt over being preceived as a "drop back" and others complained of fatigue and emotional strain. In addition, there was concern over the need to make early decisions regarding graduate medical education.

There was uneasiness among both clinical and science faculty about the decreases in basic science instruction. Both also expressed increasing displeasure with need for continuous intensive teaching spanning the summer quarter. In addition to the lack of a break in a vigorous and taxing instruction sequence, there appeared to be no regular time for basic science electives, necessary tutorials, course make-up, or a prematriculation course series. Another criticism involved the graduate medical education programs, since faculty also have such responsibilities. New house officers require additional attention during their early days on service in the summer.

These factors, as well as the diminishing credence of the physician shortage, changing fiscal aspects, and the spectrum of perceptions regarding qualitative aspects, brought the decision to change to a basic four-year format.

Many of the arguments advanced in favor of shortening the standard medical school curriculum to three years may no longer be valid, and such shortening may cause tensions among students and faculty. Further, this innovation in curriculum does not materially address issues such as physician availability, quality, and maldistribution. Success in curricular design is intimately related to accommodation of individual intellectual pursuit, cultivation of independent thinking, and redefinition of core material. Such aspects developed on a sound biomedical scientific base will best serve future physicians regardless of career choice, and are best presented in a four-year time frame.

Quality Assurance in Nursing

By Helen Frank Bensimon

The nation's most comprehensive mechanism for measuring the quality of nursing care has been developed by investigators from the Division of Nursing at Rush-Presbyterian-St. Luke's Medical Center and the Medicus Systems Corp.

They have developed 300 carefully worded criteria to measure quality, which have been rigorously tested for validity in 19 hospitals around the country. These criteria are the basis for the Medical Center's quality assurance program in Nursing, instituted in 1974, which is a national model.

The quest for a mechanism to measure quality of care began in 1972, when the Department of Health, Education, and Welfare awarded the investigators a one-year contract to assess the state of quality monitoring efforts around the country.

"As soon as we began, we realized that no true measure of the quality of nursing care process existed," says Sue T. Hegyvary, R.N., Ph.D., Associate Professor of Nursing and Chairman of the Department of Medical Nursing. Dr. Hegyvary was one of four principal investigators for the study.

Over the next three years the team established, refined, and tested criteria for evaluating how nursing units are organized; the care patients receive; and the variables that affect this process.

Co-investigators with Dr. Hegyvary were Richard D. Jelinek, Ph.D., President of Medicus System; R.K.D. Haussmann, Ph.D., vice president for Research and Development at Medicus; and John R. Newman, Ph.D., a sociologist who was formerly on the Rush University faculty.

The investigators trained groups of observers to test the criteria in the 19 hospitals, which included community hospitals, hospitals affiliated with medical centers, inner-city hospitals, and one rural hospital. By studying the data of these observers, the investigators were able to refine the standards continuously over the course of the study. The scope and precision of the criteria are unique.

"The single greatest difficulty was in maintaining validity and reliability." Dr. Hegyvary says. "Different phrases meant different things to different people. Phrases were tested over and over again to be certain that the data they would yield would be reliable.

"Our major achievement was to develope a very comprehensive method for measuring nursing process, that is, for measuring the quality of the actual activities that make up the practice of nursing."

Nursing process consists of assessment, planning, implementation, and evaluation. When a patient is admitted to the hospital, the nurse is responsible for assessing his immediate needs and family status. She must discern what the family knows about the illness and how much support they can give the patient. The nursing staff is also responsible for planning the day-to-day aspects of the patient's care, based on his specific problems and needs, and for the implementation of the plan of care as well as for the evaluation of the patient's response to care. The criteria, grouped into six main categories and 28 subcategories, look at every possible aspect of this process, and at the many variables, such as the managerial services on the unit and facets of administration which might affect this process.

Another problem could be the subjectivity of the coordinator. Since assignments are randomly given, several coordinators participate in the assessment of a unit over the course of a month. Coordinators are also regularly tested for the reliability of their observations. Two coordinators must have at least an 85 percent degree of agreement in observing the same criteria. If the level of concurrence is less, they must discuss points of disagreement and undergo further testing until the prescribed percentage is attained.

Virginia Maikler, R.N.
quality assurance coordinator

"However, the tool seems to be so well spelled out, that we usually have a 90 to 95 percent agreement," Ms. Jezek said. "Obviously if we feel that a coordinator is not collecting reliable data, we will have to evaluate the situation. Our ability to function is only as good as our data base."

To further perfect the monitoring mechanism, the investigators have recently submitted a proposal to the department of Health, Education, and Welfare, seeking funds to develop criteria to assess the quality of nursing care in psychiatric units, emergency rooms, labor and delivery rooms, and newborn special care units.

How is the measurement of quality of care put into constructive use?

At the Medical Center, there is a staff of 14 fulltime, quality assurance coordinators who are involved in both quality monitoring and helping effect changes based on data produced through monitoring. All are registered nurses with a minimum of a B.S. degree and three years of clinical experience, some of which has been as a head nurse or supervisor. They monitor surgical, medical, pediatric intensive care, gynecology, recovery room, and newborn nursery units, observing each unit over a one-month period each quarter.

The coordinators collect data from patient records by observing patients, interviewing them and the nursing personnel, and by observing the patient environment, the general functioning of the unit and the activities of the unit manager. All data is subjected to computerized analysis.

"We are not policemen," says Judith Jezek, R.N., M.S., Assistant Professor in the College of Nursing, who directs the quality assurance program.

"Our job is to provide data for decision making and to help solve problems. We try to function as a support service to all the clinical departments of nursing. We do the quality monitoring but we also offer staff development and education, and help work out improved policies and procedures."

The coordinators survey units for one month each quarter. During this time, there are 20 visits in the course of which medical records are studied, staff are interviewed, personal observations are recorded and 20 different patients are interviewed. The unit is monitored day and evening but not on the night shift because patients are usually sleeping. The coordinators cannot choose the unit they are surveying. Times, dates of observation, names of patients to be interviewed, and all other aspects of the assignments are selected at random. About 50 criteria are checked on each unit.

If quality scores show a decline, possible reasons are studied. Was the workload up? What was the staffing pattern? Should it be changed? Were there morale problems? Has the unit been receiving a different sort of patient than in the past? The coordinators then meet with the head nurse and teacher practitioner on the unit to discuss trends, study the reasons for these trends, and plan improvements if necessary. Some units with high scores are so proud of their achievements that they post them on their bulletin board," Ms. Jezek said.

"In general the quality of care in the units has gone up dramatically since we instituted quality assurance" she said.

Because of the necessarily subjective nature of some aspects of the program, there are built-in safeguards to ensure reliability. It was felt that patient interviews are essential. Obviously, however, some patients might be either intimidated or hostile and thus give a distorted picture of aspects of their care. However, Dr. Hegyvary said, "although there are some problems in getting completely honest answers from patients, we feel that the size of the sample provides us with an adequate balance of patient opinion."

Corporate Reorganization and Expansion

New college, new officers, network expansion mark progress of institution

Corporate reorganization, election of trustees and officers, and establishment of a new College of Health Sciences highlighted the annual meeting of the Trustees, November 19, 1975.

As its first order of business, the Trustees approved by-laws constituting the Board of Trustees as the governing body of Rush-Presbyterian-St. Luke's Medical Center, supplanting the Executive Board, with business and property of the Corporation to be managed by the Voting Trustees.

Edward McCormick Blair was re-elected chairman of the Board of Trustees and of the Executive Committee, and Harold Byron Smith, Jr. and Frederick G. Jaicks, were re-elected vice-chairmen.

James A. Campbell, M.D., president and chief executive officer of the Medical Center, was re-elected president.

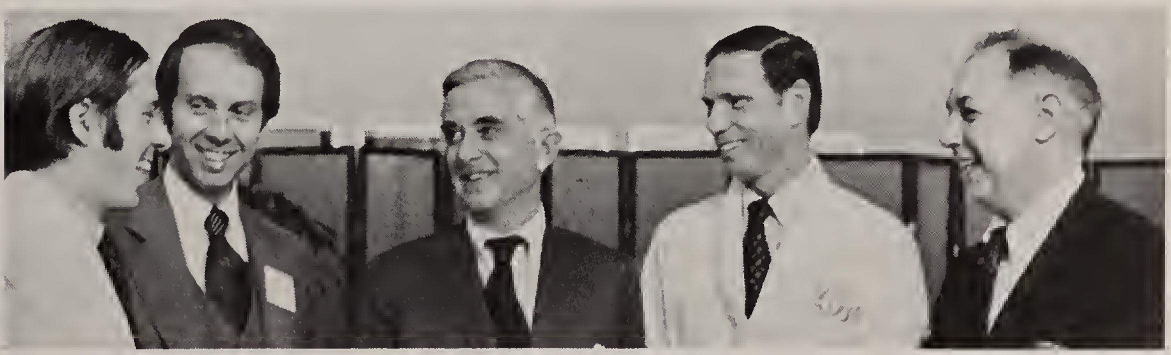
Four long-term trustees were elected as life trustees: William F. Borland, after 25 years service; Brooks McCormick, after 19 years service; Richard W. Simmons, after 19 years service; and Solomon Byron Smith, after 23 years service.

Gail L. Warden, executive vice president of the Medical Center, was re-elected secretary of the Board of Trustees and Lloyd W. Bowers, partner in the law firm of Gardner, Carton, and Douglas was re-elected general counsel. Donald R. Oder, formerly vice president for finance, was named senior vice president of the Medical Center and was re-elected treasurer.

In addition to Blair, Smith, Jaicks, and Campbell, the following were elected members of the Executive Committee: Roger E. Anderson; Edward C. Becker; Edward F. Blettner; Maurice L. Bogdonoff, M.D.; Joseph A. Burnham; Kent S. Clow, Jr.; A. B. Dick, III; Thomas E. Donnelly, II; Robert C. Gunness; Stanley G. Harris, Jr.; Edgar G. Jannotta; Mrs. William G. Karnes; James E. Olson; Thomas H. Roberts, Jr.; Richard L. Thomas; and George B. Young.

In his discussion of corporate reorganization, Dr. Campbell cited the specific objectives which guided the ad hoc steering committee in arriving at its recommendations to:

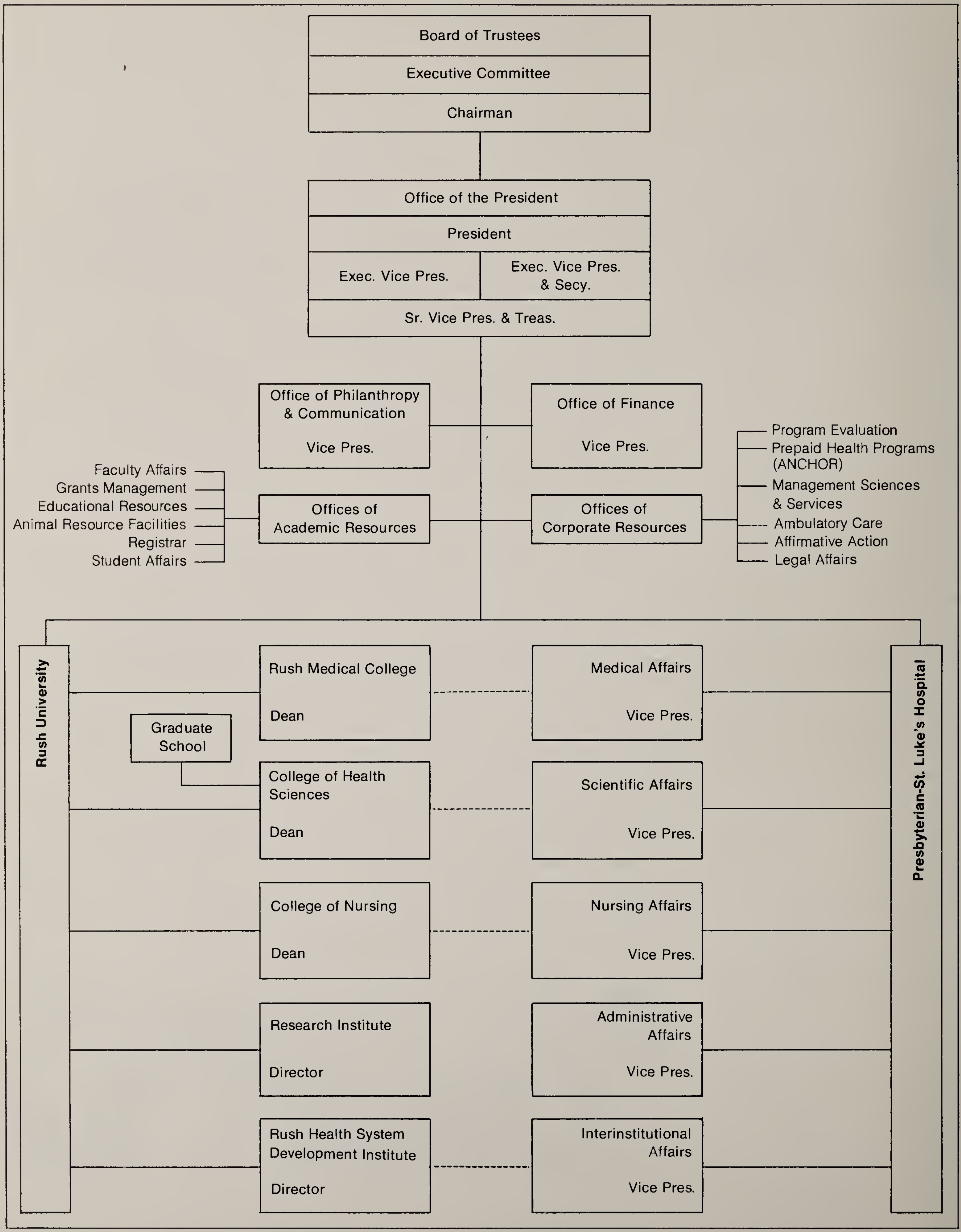
1. Increase the Trustee's effectiveness and involvement in the affairs of the Corporation.
2. Preserve the present corporate name. Emphasize the unity of the care and academic elements of the Medical Center at every level within the organization balancing these elements through strong and effective management.



Three new trustees, elected at the Annual Meeting in November, are R. Joseph Olk, M.D. (left), a 1975 graduate of Rush Medical College, Rev. David Donovan (second from left), stated clerk of the Presbytery of Chicago and Maurice L. Bogdonoff, M.D. (right), president of the medical staff at RPSL.

Greeting them are Edward McCormick Blair (middle), chairman of the Board of Trustees and James A. Campbell, M.D., president and chief executive officer of RPSL.

Rush-Presbyterian-St. Luke's Medical Center



3. Recognize academic achievements and commitments by underlining the Rush University status, emphasizing its identity with the public for better understanding and support.
4. Recognize the importance of the patient care base by emphasizing Presbyterian-St. Luke's Hospital as a clear and recognizable entity.
5. Recognize the importance of research as a vital element of both optimum patient care and quality education, and an essential to expanded human knowledge.
6. Improve efficiency and effectiveness of the Medical Center and its programs described in 2, 3, 4, and 5, utilizing, whenever possible, management techniques associated historically with commercial and industrial enterprise rather than relying only on traditional academic or health care administrative methodologies.
7. Utilize structure and function to augment and preserve Corporate resources. (See organization chart, this issue).

"One of the most new and innovative proposed components of Presbyterian-St. Luke's Hospital is Interinstitutional Affairs and its counterpart in the University, the Rush Systems Development Institute. This addition should enhance our efforts to develop the Rush University System for Health which currently embraces a network of affiliated community hospitals, and to expand it to its fullest potential. It also enables more active pursuit of shared services and the acquisition of units which may be useful in the development of the Rush System," Dr. Campbell said.

Rush University Establishes College of Health Sciences

Rush-Presbyterian-St. Luke's Medical Center has established a new College of Health Sciences at Rush University offering degrees at the baccalaureate, master, and doctoral levels. The College joins Rush Medical College, reactivated in 1969, and the College of Nursing, opened in 1972. David I. Cheifetz, Ph.D., associate dean of Biological and Behavioral Sciences, has been named acting dean of the new College.

"The College of Health Sciences, established by the Board of Trustees of the Medical Center at its November 19, 1975 Annual Meeting, will provide a scientific and academic base for teaching, research, and patient services in the health fields other than medicine and nursing," said James A. Campbell, M.D., president of Rush-Presbyterian-St. Luke's.

"The action of the trustees reflects their perception of health manpower needs in a variety of special tasks that can only be undertaken by trained professionals as scientists and full-fledged members of the health team," he said.

The College of Health Sciences will include three major program divisions:

- The Office of Biological and Behavioral Services, comprising eight basic science departments;
- The Office of Related Health Science Programs, where the emerging new professions in the technology, administration, and systematization of health care will be trained for science degrees at all three levels; and
- The Office of Multi-Disciplinary Center programs which will have as its primary function the coordination of the scientific experience and potential of the Medical Center in addressing basic questions arising out of medical care.

Rush University, established in 1972, is one of the nation's newest institutions of higher learning dedicated wholly to the training of physicians, nurses, allied health professionals, managers, and scientists for the health field. Current enrollment is 651 students.

Rush University is the academic component of Rush-Presbyterian-St. Luke's Medical center, while Presbyterian-St. Luke's Hospital, with 864 beds, is the patient care component. A tertiary care hospital referral center, Presbyterian-St. Luke's has 640 physicians and scientists on its staff and 269 house officers (interns, residents, and fellows) in its graduate medical education programs. Members of the medical staff hold faculty appointments in Rush University.

"The growth and development of Rush University as the academic component of the Medical Center has been steady, productive, and rationally organized to meet Chicago area, state, and national needs and to realize our institutional objective of a single high standard of care for all patients," said Dr. Campbell. "As faculty and curricula have grown, so have the number of professionals with specialized knowledge in key areas related to health—clinical nutrition, medical and radiation technology, health management sciences, occupational and physical therapy, and pastoral care—as well as in the established disciplines of anatomy, biochemistry, biomedical engineering immunology, microbiology, pharmacology, physiology, psychology, and the social sciences. Researchers and students alike have sought an institutional framework designed to accommodate their interests and fields of endeavor. The College of Health Sciences has been established to respond to the health needs of the communities we serve locally and nationally and to the needs of professionals responsible for the delivery of health care," Dr. Campbell concluded.

RPSLMC Expands Cooperation with Mount Sinai Hospital Medical Center

A comprehensive agreement that will result in expanded medical education programs and the training of more physicians to practice in urban areas was signed December 18, 1975 by Mount Sinai Hospital Medical Center and Rush-Presbyterian-St. Luke's Medical Center.

In March 1975, the two Medical Centers announced an agreement that initiated a program of medical education for Rush Medical College students using the facilities and faculty of Mount Sinai. The new agreement contributes significantly to the development of an integrated health system by expanding areas of cooperation to include programs on graduate medical education, continuing education, nursing, patient care, research, and interinstitutional support services.

RPSL and Mount Sinai representatives said the cooperative effort was established "for the purposes of fulfilling the common goals of bringing the highest level of quality care to their broad communities, providing high quality education in the health fields, enhancing research activities, and achieving efficiency and economy in these and related activities." (cont'd.)

Under the agreement, each institution continues to be an autonomous corporation governed independently by its respective governing body.

A Joint Policy Committee, with both institutions equally represented, was established to review, hear, and determine policy issues which affect the programs and purposes of the agreement. Similarly, a Joint Management Committee, also with equal representation, was established to keep the corporate Joint Policy Committee informed and to coordinate the conjoint functions of the two institutions.

William F. Hejna, M.D., vice president, Medical Affairs and dean, Rush Medical College, said appropriate faculty appointments to Rush Medical College for members of the Mount Sinai medical staff are being made under the rules of governance of the College.

Mount Sinai Hospital Medical Center is a 479-bed teaching institution providing various outpatient and inpatient service to the entire metropolitan area. In addition to its programs of undergraduate and graduate medical education, the Center is also engaged in the education of a variety of paraprofessional health personnel including nurses, blood banking specialists, and radiologic technologists. It provides extensive outpatient and health education services to a broad population through the Sinai Medical Group, a series of group practices involving all the major medical specialties including primary care. It conducts a variety of basic and clinical research programs. The hospital is an affiliate of the Jewish Federation of Metropolitan Chicago.

Sheridan Road Facility Means More Growth

Rush-Presbyterian-St. Luke's Medical Center has leased the hospital facilities at 6130-6134 North Sheridan Road, Chicago, to be operated as an integral part of the Medical Center's programs in patient care, education, and research.

The 175-bed facility, which has been known as Northeast Community Hospital, was designated the Sheridan Road Pavilion of Rush-Presbyterian-St. Luke's Medical Center. The focus and thrust of patient care programs at the Sheridan Road Pavilion will be oriented toward primary medical care and mental health services.

The Sheridan Road Pavilion of RPSL began functioning as part of the Medical Center on January 2, 1976. Programs in internal medicine, psychiatry, and ambulatory and short-stay surgery are being introduced and will be expanded over the next six months while renovation and remodeling are carried out.

Authority to enter into a leasing arrangement with the Charity Hospital Association, which had been operating the facility, was approved by the Executive Committee of the Board of Trustees of the Medical Center on December 17, 1975.

The Sheridan Road Pavilion is being staffed initially by physicians, management, and health professionals from the Medical Center's main campus on the near West Side. New appointments will be made under the medical staff by-laws and faculty rules of governance at the Medical Center. Certain employees already on the staff of Northeast Community Hospital underwent in-service education and training to learn procedures and policies of RPSL.

Since early October, RPSL had been serving as a consultant to Northeast Community Hospital. On November 21, 1975, the Board of Directors of the Charity Hospital Association appointed a management/consultant team from the Medical Center to manage the hospital while continuing to study, evaluate, and make recommendations concerning its future.

On November 25, 1975, members of the Charity Hospital Association resigned their positions in favor of the current members of the Association: Edward McCormick Blair, Harold Byron Smith, Jr., Frederick G. Jaicks, and James A. Campbell, M.D., all of whom are trustees of Rush-Presbyterian-St. Luke's Medical Center. A Board of Directors for the Charity Hospital Association also was formed including the four persons named above and Gail L. Warden, William F. Hejna, M.D., Donald R. Oder, and Sheldon Garber, all corporation vice-presidents of RPSL.

Of the 175-bed capacity of the Sheridan Road Pavilion, 100 beds are currently available for the new programs to be introduced, while remodeling and renovation will be needed to make the remaining 75 conform to new program requirements.

Accreditation

Rush Medical College

College of Nursing

Presbyterian-St. Luke's Hospital

Rush Medical College

The Liaison Committee on Medical Education has conferred on Rush Medical College full approval on the program terminating in the M.D. degree, for a period of four years from the completion of the survey visit. The Liaison Committee has also recommended continuation of full institutional membership of Rush Medical College of Rush University in the Association of American Medical Colleges.

The Survey Team noted the following with approval:

- Within a relatively short time the Rush Medical College has been reactivated and progressively assembled academic resources to achieve a satisfactory program of undergraduate medical education. This progress has followed the organization of basic science departments to complement the hospital-based faculty which has consistently participated in the clinical portion of medical education.
- The organization of the Medical College has evolved to recognize the importance of and to include the traditional basic science departments.
- The developments to this time of the Medical College confirm the vision and ability of senior administrators of the Medical Center and of the Medical College.
- The educational program is soundly financed from a variety of sources for both capital improvement and for current operation. The identification through a sophisticated system of accounting of those areas which are common to the service activites of a medical center and to the educational program has provided a substantial financial base for medical education. The magnitude and breadth of this base should provide valuable protection against the adverse impact of sudden change in the single source of financial support.
- In the development of the clinical faculty, there appears to be a desirable and harmonious blend of those whose primary commitment and support relates to medical education and those whose interest in medical education is significant but whose support comes from private practice.
- Plans for the construction and acquisition of additional plant resources have been well planned and the building under construction will prove a valuable addition. The space available for the library in this construction project will correct a current deficit in library space.
- The previously criticized animal facilities have been relocated in adequate quarters.
- The commitment by the faculty and administration to the procedure for selecting medical students and for the conduct of student affairs is admirable. The time devoted to these activities has strengthened the commitment of both faculty and students to the Medical College.
- Philosophically, the development of a dispersed network of affiliated hospitals is tangible evidence of concern for the community and constitutes a potential resource for each part of the continuum of medical education. A few of these hospitals already provide valuable support for the teaching of obstetrics and pediatrics.

College of Nursing

The College of Nursing of Rush University has received initial accreditation for undergraduate and graduate nursing programs for eight years by the National League for Nursing, announced Luther P. Christman, Ph.D., Dean.

"By meeting the high standards of this national accreditation body and reflecting quality control of curriculum and student experience, the College of Nursing enters a select group of institutions whose graduates are assured their training has prepared them for positions in any hospital in the country as well as for post-graduate study," Dean Christman said.

The College of Nursing (formerly the College of Nursing and Allied Health Sciences) already is accredited by the North Central Association of Colleges and Schools, and approved by the Illinois Board of Registration and Education.

James A. Campbell, M.D., president of Rush-Presbyterian-St. Luke's Medical Center, said: "For a three-year-old institution to earn accreditation from a prestigious body such as the National League for Nursing is a remarkable achievement. Dean Christman, the faculty, staff, and students of the College of Nursing are to be congratulated for the splendid work that has placed the College of Nursing among the nation's best in this important field."

Presbyterian-St. Luke's Hospital

The Joint Commission on Accreditation of Hospitals has given a two-year accreditation to Presbyterian-St. Luke's hospital.

Field representatives of JCAH conducted an on-site survey on October 23, 24, and 28, 1975, and accreditation was announced in January. This authorization indicates that the hospital is meeting the standards of hospital care, as set by the JCAH. These standards set forth optimal goals of excellence by which a hospital can measure itself and be measured by JCAH.

Although accreditation by the JCAH is not legally necessary, health care facilities have sought accreditation because it represents a benchmark of quality that is higher than governmental licensure alone.

"The Medical Center is proud to have received such a high rating from the JCAH," said Howard Jones, vice president, Administrative Affairs. "It is a tribute to the hard work and dedication of all hospital employees in providing the highest quality of care to our patients," he concluded.

RushRounds

The Beat of Life: Listening to Heart Sounds

A new system that allows large groups of students and physicians to listen simultaneously to a patient's heart sounds has recently been installed in the A.B. Dick Auditorium at Rush-Presbyterian-St. Luke's. It is the first system of its kind in the Chicago area.

Called the Tavel-Andries (TA) Heart Sound Recording System, it consists of 102 stethophones that are part of a sound amplification system that can be hooked up to the auditorium seats and, on the other end, a stethoscope.

The TA system can be utilized to listen to an actual patient's heart or to transmit simulated and tape recorded heart sounds. Total cost of the system was $6,000.

Philip R. Liebson, M.D., associate attending physician and associate professor of Medicine, was instrumental in evaluating and purchasing the system. The new system, Dr. Liebson said, "allows us to teach physical diagnosis of heart sound recordings to large groups of students and physicians as it can reproduce any type of heart sound that might come from a patient."

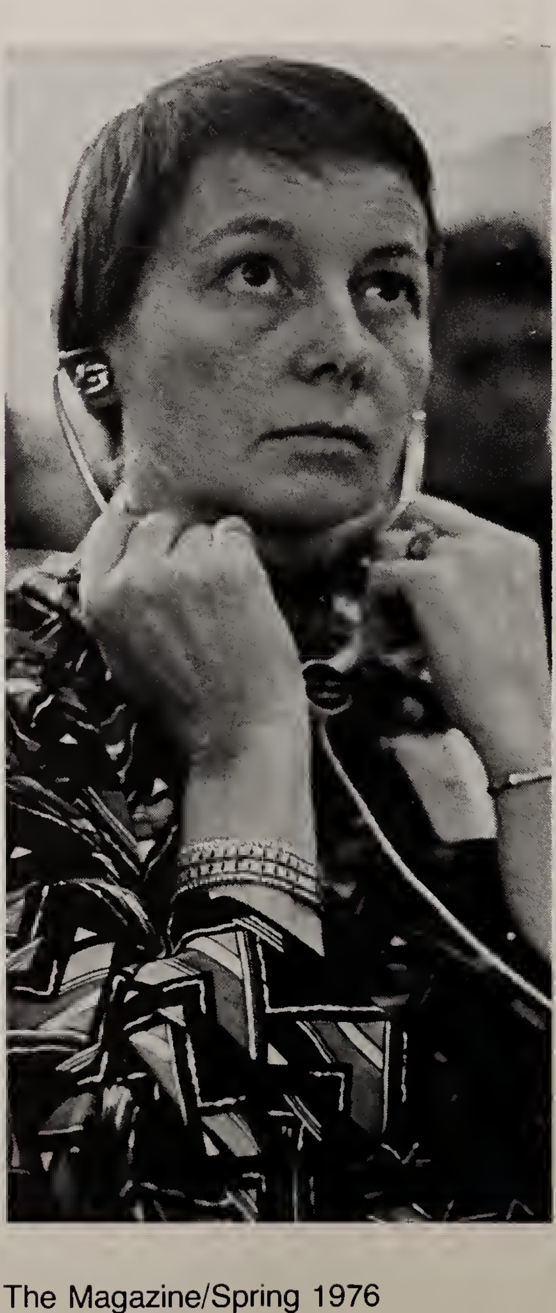
Dr. Liebson said that the best way to learn about heart sounds, however, is to use a patient in the demonstration, because changes in heart sounds due to breathing or other physiological maneuvers can only be indicated this way.

Another benefit of this system, Dr. Liebson said, is that RPSL's nine affiliated hospitals can be drawn into the teaching program here by having physicians from those hospitals come to RPSL to discuss physical diagnosis. Network physicians were invited to a demonstration of the TA system in October. Similar sessions utilizing the new system will be held every three weeks to allow greater participation by network physicians.

The Medical Center also has a portable system for grand rounds teaching. The portable TA system consists of a small box-shaped device called an auscultation aid and seven stethophones. Used at the patient's bedside, a recording stethoscope is placed on the patient's chest and is hooked up to the auscultation aid. This device transmits the heart sounds to a minimum of six stethophones that can be connected to it.

Dr. Liebson hopes to supplement the system with other devices, as one for transmitting impulses on the chest that would aid in teaching palpatations to students. Another supplement available to the system is a closed circuit television mechanism, in which a camera captures such things as neck pulse and chest impulses.

Other persons at RPSL who helped to implement the sound system were: A. Lenn Block, director, Educational Media; Lester Wolf, Educational Media; Robert M. Kark, M.D., senior attending physician and professor of Medicine; Joseph V. Messer, professor of Medicine and director of the cardiology section, and Ralph Zitnik, M.D., associate professor of Medicine.



Protecting the Children Against Abuse, Neglect

Under the Illinois Abused Child Act, physicians and hospital personnel are required to report cases of suspected child abuse or neglect to the Illinois Department of Children and Family Services. (IDCFS).

Recognizing that any effective approach to dealing with child abuse must respond to three aspects—identification, reporting, and extended assistance—a group of professionals at Rush-Presbyterian-St. Luke's voluntarily formed a Child Protection Team in 1974. Members of the team include a pediatrician, a pediatric psychologist, a pediatric nurse, and a social worker.

"The primary purpose of the team is to improve the quality of care of children and families reported by Presbyterian-St. Luke's Hospital for suspected child abuse or neglect," says Donald W. Day, M.D., the pediatrician.

To accomplish this, the team has set up programs to educate the medical and nursing staffs about the procedures for identifying and reporting such cases.

"Last year, the team reported about 50 abuse and neglect cases and it will probably double that this year," Dr. Day said. Most of the abuse cases are seen in the pediatrics emergency room or in the clinic, with a nurse or physician usually notifying one of the team members about suspected cases.

Cases are reported by a hospital administrator or by the attending physician to the IDCFS via a hotline. Written case reports are submitted later.

The Child Protection Team follows up on all cases reported. Team members try to work with the child, the family, the state social worker, and the legal system to resolve the problem. Much of the coordinating work is done by Marj Kaplan, A.C.S.W., in the Social Service Department.

Outside agencies also cooperate in the team efforts, among them The Child Advocate Association, a voluntary organization of lawyers in

RushRounds

Chicago; numerous family and community agencies, such as Catholic Charities; and Marillac House, a social agency that cooperates in reporting cases of child abuse. Rush-Presbyterian-St. Luke's provides the medical back-up.

"The goal of the team is to keep the family together by finding some means of therapy so that the abuse won't happen again," said pediatric psychologist Christine T. Costello, Ph.D.

"Therapy includes making such things as medical, psychological, and social services available to the individual child and the family," explained Robin Callahan, R.N., pediatric nurse.

The Child Protection Team is "a lunch-time business," meeting once a week to keep abreast of the cases. But consulting takes place any time, day or night.

In addition to their work at Rush-Presbyterian-St. Luke's, team members have spoken before outside agencies about abuse and neglect. Dr. Day has made two radiotapes for the American Medical Association, in addition to speaking at a Chicago police seminar about child abuse, and Ms. Costello conducted a half-day seminar with physicians and other health care personnel on the resources available in the Chicago area to help in child abuse cases.

Cancer Center Funded The Work Goes On

Rush-Presbyterian-St. Luke's Medical Center has established a multidisciplinary Cancer Center with a three-year National Cancer Institute grant totalling approximately $750,000.

The Cancer Center will coordinate ongoing cancer research and treatment programs, a multimillion-dollar effort involving several departments. The Center will also expand educational activities to affiliated community hospitals in the Rush network and other hospitals already involved in Medical Center cancer programs. Medical Center and network hospital physicians saw over 4500 cancer patients last year.

Initial funding of $247,000 for Rush Cancer Center is being spent on developing personnel and facilities, and instituting a patient data collection system, according to Frank R. Hendrickson, M.D., acting director of the Cancer Center. Dr. Hendrickson is senior attending physician, and professor and chairman of Therapeutic Radiology.

The major goals of the Cancer Center are:

- To expand cancer education and training programs at all levels of study in cooperation with affiliated hospitals,
- To broaden multi-disciplinary cancer research activities at both basic science and clinical levels,
- To extend treatment programs and innovations to community hospitals in the network as quickly as possible, and
- To support new cancer research projects.

One-third of the award money will go to expand the outreach education programs in the Medical Center's 10 affiliated network hospitals. Programs include teaching conferences, residency training programs, and tumor registry boards.

Late Speakers Get Early Care

Jane is a delightful, lovable two-year-old baby. She is curious about everything and loves to play and be with people. Only her speech and motor development have been unusually slow.

Jane has been participating in a year-old program at RPSLMC, for the last six months, called the "Parent-Infant Speech Stimulation Program." It involves both child and parent(s) and is designed to maximize a child's mental development by teaching parents how to provide a more stimulating home environment.

The idea for the program originated with Mary Bacon, M.A., a speech therapist in the Section of Communicative Disorders. Ms. Bacon said that research over the past decade has shown that the years from birth to age three are very critical to a child's development.

"Unfortunately, the home, and often the parents have been regularly excluded from language therapy programs during these years," she says.

Currently, there are about 12 children in the program, ranging from one-and-a-half to three years of age. "The success rate has been good . . . a lot depends on the mother," Ms. Bacon said.

To qualify for the program, children must be not more than three years old. Participants include mentally retarded children or children with mentally retarded or "borderline normal intelligent" parents; children from an environment of poverty, if there seems a need for information and practice in providing more effective stimulation for language learning; children with birth factors known to correlate with later language and learning problems (for example, Downs Syndrome); severely visually handicapped children; and others with known or suspected developmental delay.

Many of the children in the program were referred by RPSL's Pediatrics Department.

Weekly half-hour sessions are held initially, allowing the speech therapist to evaluate the mother and child and to develop an appropriate program. Later, these are extended to monthly sessions. Although the speech therapist works directly with the mother and child, a room with a two-way mirror is often utilized during a portion of each session to allow observation of mother and child interaction.

"The curriculum is adapted to the needs of each child," Ms. Bacon said. One session might deal with encouragement of baby-gestures and associated words to accompany games and events. As the child progresses, the therapist will introduce other things, such as imitation games (pat-a-cake), or use repetitive words and phrases in situations likely to produce comprehension and later expression of meaningful words.

Children in the language stimulation program are frequently seen by the Physical Therapy Department under the guidance of Mary Lizz Etzel, M.S., Physical Therapist, who monitors the motor development of the children.

(cont'd.)

"Our early physical therapy intervention is based on the assumption that parents can and want to provide good care for their children with motor problems," Ms. Etzel said.

Early intervention, she explained, is important because brain plasticity is greatest during the first 18 months of life and therefore the highest potential for compensation for effects of motor problems is during this time period.

Parents are given instructions on home management, which includes simple activities not requiring elaborate toys or complex directions. Ms. Etzel said, "We hope that our suggestions may circumvent the problems of sensory deprivation and inadequate intellectual stimulation often seen in children with significant motor problems."

After a child in the program reaches age three, Ms. Bacon tries to place him/her in a pre-school setting for a broader experience and/or continue language therapy as needed. In the future, Ms. Bacon hopes to assemble groups of mothers to give them ideas on how to deal with a child whose development is slow, in addition to seeing children and parent(s) on an individual basis.

Venous Balloon; New Weapon Against Bloodclots

A new technique for preventing blood clots from traveling to the lungs, one of the most common causes of patient death in hospitals, has been developed and proven successful at RPSLMC in an initial study of 50 patients. The method, which uses an unique venous balloon device, eliminates trauma of surgery and general anesthesia for patients already seriously ill.

The venous balloon procedure was developed by James A. Hunter, M.D., cardiovascular-thoracic surgeon, Presbyterian-St. Luke's Hospital, and professor, Rush Medical College. Mr. Robert Sessions, an electronic engineer and consultant to the cardiology section, designed the device, a balloon-bearing catheter. Jerry Petasnick, M.D., diagnostic radiologist at the hospital and associate professor at Rush Medical College, has provided the essential radiology skills for proper placement of the balloon.

According to Dr. Hunter, pulmonary embolism is a potentially fatal condition in which blood clots form in the legs or pelvic area and travel through the major vein to the heart and lungs.

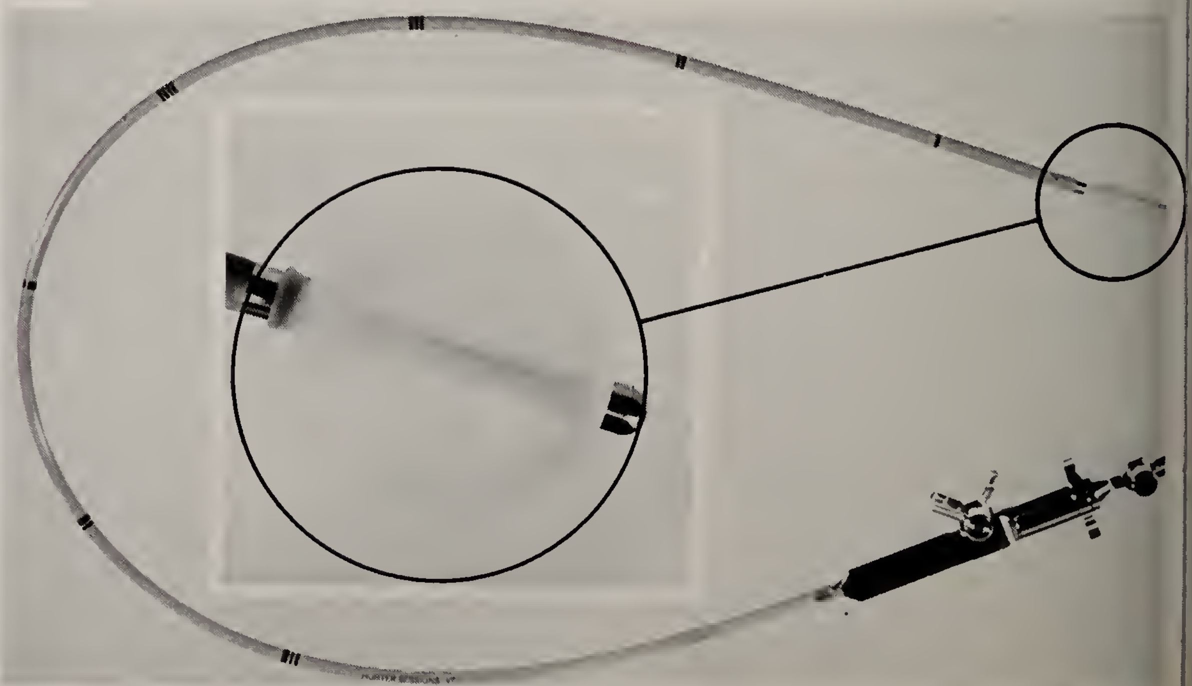
In traditional treatment of this condition, the patient is given anti-clotting drugs. When the drug cannot be safely administered or blood clots move to the lungs despite it, mechanical obstruction of this vein, the inferior vena cava, is necessary. Unfortunately, surgery to tie-off the vein is associated with significant mortality because patients needing the operation often cannot tolerate anesthesia and the impact of major surgery.

"With the new technique, the patient remains awake. The balloon-tipped catheter is inserted, under local anesthesia into the jugular vein in the neck," Dr. Hunter explains.

"Running the length of the three-foot catheter is a needle that is connected to a syringe to 'pump up' the balloon at the catheter's opposite end," Dr. Petasnick says. "The outer catheter allows easy insertion of the balloon and injection of a contrast fluid to allow visualization via x rays.

"Fluoroscopy is used to permit TV screen viewing to guide balloon movement through the vena cava, ensuring proper positioning of the balloon above the blood clot, blocking migration of the clot. As the balloon is inflated, it conforms to an oval shape, fitting snugly within the walls of the vein," Dr. Petasnick said.

Withdrawing the inflation needle separates the balloon from the catheter. Within 6 to 12 months, the balloon collapses, with scar tissue forming to hold the balloon core in place. The



Balloon tipped catheter is first inserted into the patient's jugular vein.
The device helps the physician to guide the balloon to the site in the vein above the clot.
Inset shows balloon inflated.

end result is essentially the same as the traditional surgery.

Drs. Hunter and Petasnick said that the balloon technique has proved safe even in their special group of very sick, high risk patients. They stressed that the new technique has an important advantage over the older methods; it permits simultaneous use of anti-clotting drugs, unlike direct surgery on the vena cava. If the patient can tolerate anti-clotting drugs, it is desirable to continue them at the time of surgery.

The physicians report that long-term follow-up, of almost six years, shows no migration of the balloon. Although some of the very ill patients have died from other diseases, no patient death was related to the balloon technique or to recurrent venous emboli.

The study appeared in the December 8, 1975 issue of the Journal of the American Medical Association.

White Cell Counting Made Easy and Accurate

The world's first computerized system for analysing white blood cells has been developed at the Medical Center Hematology Laboratory.

Called LARC (leukocyte automatic recognition counter), the system was designed and tested here over the past five years by James Bacus, Ph.D., assistant professor of Biomedical Engineering, in conjunction with the Corning Glass Works. Corning is now producing and marketing the instrument for world-wide distribution.

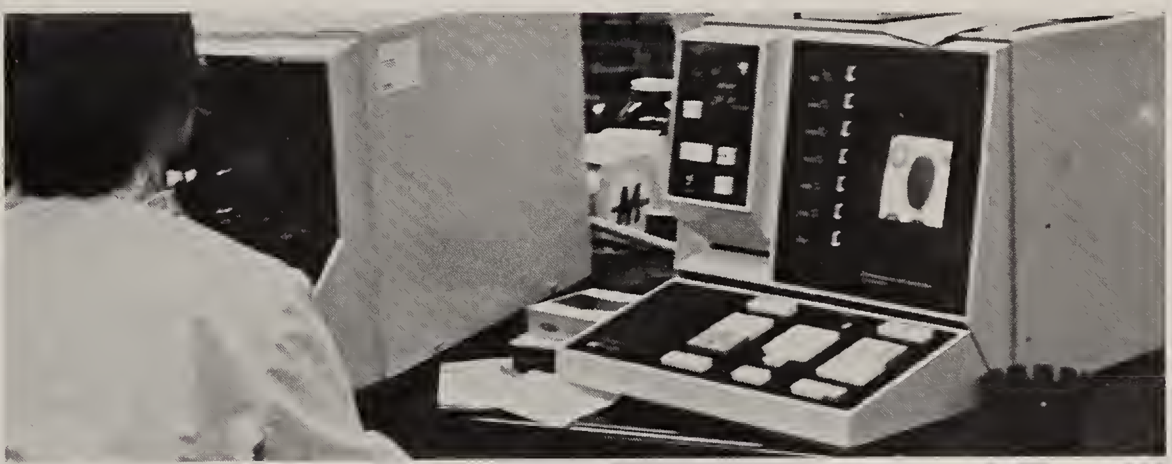
Dr. Bacus described LARC as "one of the first medical robots. It is a computer with television eyes that looks at cells and performs a complex visual inspection task."

Analysis of white blood cells (leukocytes) is essential for determining the general state of a patient's health and is a major factor in diagnosis. "By indicating with exceptional accuracy the percentage of each of six different categories of white blood cells in a sample, LARC can greatly simplify and refine the diagnostic process," Dr. Bacus said. "What's more, it can do the job at top speed. LARC can classify 100 white cells in one minute and can perform 30 cell differentials (analyses) in one hour, slightly less than a trained medical technologist can perform by conventional methods in the course of one day," according to Dr. Bacus.

The analyser is operated by a trained technologist. It incorporates a microscope, a computer, and a television console that show greatly magnified pictures of the cells. The technologist places the slide under the microscope in the conventional manner.

The analyser is programmed to measure the features of cells and to make a decision about them based on programmed probabilities. The machine scans the sample, locating and classifying some 100 leukocyte cells noting the shape, relative density, and size of the nucleus. A digital image is produced on the screen and compared to the master images of the cell types, so that recognition and classification of a cell type can be carried out.

If an abnormal cell appears, it is categorized and can be automatically recalled to view on the microscope and console screen so that the technologist can re-examine the cells and make an appropriate comment on the report.



Despite its efficiency, LARC is not viewed as a mechanism for reducing the number of technologists. Rather, "the two LARC systems at the Medical Center are considered vital tools for increasing efficiency and productivity and for freeing skilled technicians from the tedious aspects of the works so that they can concentrate on analysis," Dr. Bacus said.

LARC is tied into a computer in the Laboratory which in turn is tied into the hospital's central computer, so that the white blood cell analysis instantly becomes part of the patient's medical record, and at the same time, is sent back to the clinic that ordered the test.

This success is only the beginning for Dr. Bacus.

He is currently attempting to develop similar analysis systems for red blood cells and pap smears.

House-officers Sign Model Contract

The great majority of house officers at RPSLMC have signed a basic contract worked out by the House Staff Association (HSA) in talks with the Medical Center Administration. Ronald Quenzer, M.D., president of the Association, said that under the contract the group is identified as "having a responsibility to represent views of its members on matters concerning the administration of house staff agreements and other matters affecting patient care and graduate medical education. The contract does not designate the association as the sole bargaining agent, as defined under the National Labor Relations Act, and house staff members have the option of joining the association." Some house officers signed an earlier contract. William F. Hejna, M.D., vice president for Medical Affairs and dean of Rush Medical College, said that the basic contract "places patient care as first priority" at RPSL and "provides a pattern for others to study."

ESTATE PLANNING: CHARITABLE GIFT ANNUITIES

By Andrew Wilcox

Rush-Presbyterian-St. Luke's Medical Center has traditionally epitomized progress in research, education, and delivery of patient care. It has been able to do so because friends of the institution have chosen to make wise philanthropic investments here.

Outright giving and bequests are certainly the most direct avenues to a meaningful role in the Medical Center health care program, but there are various programs that accomplish the philanthropic desires of donors while protecting their financial futures. One of these "deferred giving" opportunities is the Charitable Gift Annuity.

The Rush-Presbyterian-St. Luke's Gift Annuity Program is designed for those friends of the institution who wish to make a significant lifetime contribution, but desire to retain the income benefits that their assets can produce. This is how the program works:

1. Donors irrevocably transfer assets to the Medical Center and can specify their desires for the future use of the funds—perhaps support of research programs, scholarships in one of the three Colleges of Rush University, or free care.
2. In return, the Medical Center contracts to pay an annual income for life to the donor and, if desired, to a second beneficiary. The amount of the annual payment is determined by the number of income recipients and their ages.
3. The donor receives a significant Federal Income Tax charitable deduction.
4. A large portion (usually more than half) of the annual payment is tax-free.
5. If an annuity is funded with appreciated securities, capital gains tax implications are reduced considerably when compared to the tax liability which would develop if the donor should sell the securities.
6. The annual payments are a contractual obligation of Rush-Presbyterian-St. Luke's Medical Center and are guaranteed by the Medical Center's assets.

For example: Mr. and Mrs. Donor (both age 65) have irrevocably transferred $10,000 to Rush-Presbyterian-St. Luke's Medical Center for Gift Annuity. In return, the Medical Center will pay them, jointly for life and then to the survivor, an annual sum of $510 in quarterly installments.

In the year of transfer, Mr. and Mrs. Donor can claim a Federal Income Tax charitable deduction of $3,444. In addition, $299 of each annual payment is tax-free, leaving only $211 taxable as ordinary income.

Upon the death of the last surviving beneficiary, the funds that they have transferred to the annuity will be used to create a research fund in their names.

Some typical annuity rates for both one-life and two-life gift annuities are:

One Life

Age	Rate
60	5.5%
62	5.7%
64	5.9%
65	6.0%
66	6.1%
68	6.3%
70	6.6%
72	6.9%
74	7.2%
76	7.6%
78	8.0%
80	8.5%
82	9.1%
84	9.7%
85	10%

CONFIDENTIAL

To: Office of Estate Planning
Rush-Presbyterian-St. Luke's
Medical Center
1725 W. Harrison St., Room 924
Chicago, Illinois 60612

From: ______________________

____
Street

____
City State Zip

Please provide me with specific details which would apply if I were to create a Rush Gift Annuity.

1st Beneficiary/Donor
Date of Birth ______________
Male ________ Female ________

2nd Beneficiary
Date of Birth ______________
Male ________ Female ________

Two Lives

Age	Rate
60-65	4.9%
62-67	5.1%
64-69	5.2%
65-70	5.3%
66-71	5.4%
68-73	5.6%
70-75	5.9%
72-77	6.1%
74-79	6.4%
76-81	6.8%
78-83	7.1%
80-85	7.4%
82-87	7.8%
84-89	8.3%
85-90	8.6%

Additional programs such as gifts-in-trust, testamentary annuities and trusts, outright bequests, and gifts of life insurance may pertain to your situation. We would be pleased to have the opportunity to discuss any of these options with you and your advisors.

If you desire specific information about Charitable Gift Annuities, fill out the information requested on the form below and mail it to our office. In turn, we will compute:

1. The annuity rate pertinent to your case.
2. The Federal Income Tax charitable deducation.
3. The portion of your income which would be tax-free.

We assure you of complete confidence and a prompt reply.

An Alum Gets Reacquainted, 35 Years Later

As a 1940 graduate of Rush, I would like to share my feelings and thoughts with you as I revisit Chicago and our alma mater, Rush Medical College.

The city has changed, with a new skyline made prominent by the Sears, Standard Oil, and John Hancock buildings. The Congress Expressway has erased many of the old landmarks, including the YMCA building and the Presbyterian Nursing Home. Cook County Hospital and the old restaurant, "The Greek's" still stand, both showing the ravages of time.

As I stood on the corner of Harrison and Wood, the part of Rush that remained unchanged in my memory is the old Rawson Laboratory building mellowed with age but bursting with history. Alongside it stands the Senn Memorial Building but from this point on toward the Loop, the Rush we knew ends and the Rush of today begins. A modern structure, still under construction, arches over Harrison Street to the Presbyterian-St. Luke's Hospital complex. Most of this building is devoted to medical classrooms and basic science laboratories. Directly across the street are two multiple-storied structures—one for student activities and classrooms and the other the Professional Building, which currently houses some administrative offices as well as offices for the clinical staff. Everywhere is growth and movement.

There is a strange feeling in returning to a place that remains so much a part of our early medical experience, only to find so little with which we can readily identify. But life is ever changing; if it were not, it certainly would be, at best, monotonous.

Yet, as I roam through more classrooms and laboratories, I cannot help but feel proud to be part of the Rush of today. If any of you should be in the Chicago area, you would find it a memorable experience to visit your alma mater. To see what has grown from the Rush of our time certainly leaves me with a real sense of personal pride.

Wayne Won Wong, '40
Honolulu, Hawaii

ALUMNI NEWS

Classnotes '05-'19

Morris Fishbein '12, (Chicago, Illinois) was saluted for his contributions medicine, education, and State of Israel Bonds at a testimonial dinner sponsor by Jackson Park Hospital. Dr. Fishbein is Emeritus Professor of Medicine Rush and at the University of Illinois College of Medicine.

Louis W. Sauer '13, (Coral Gables, Florida) was guest of Honor at a 90th birt day party in August, held on Chicago's North Shore where he spent well over years as pediatrician to many thousands of children. Dr. Sauer is renowned his development of the whooping cough vaccine and his contribution to the n familiar DPT shots for tetanus, diphtheria, and pertussis.

William S. Jones '15, (Menominee, Michigan) was named recipient of the Ce tificate of Commendation, the highest award offered by the Michigan State Me cal Society. Dr. Jones served his internship at Presbyterian Hospital, prior continuing his studies in otolaryngology and opthalmology at the University Pennsylvania, the Knapp Clinic in New York, and the University of Vienna.

Johanna Heumann '19, (Chicago, Illinois) recently received honorary me bership on the staff of Wyler Children's Hospital, the University of Chicago, a in the Department of Pediatrics. Dr. Heumann, who is 80, has practiced pedi trics and lived in Chicago's Hyde Park since 1926.

Classnotes '23-'27

Vernon J. Hittner '23, (Seymour, Wisconsin) was recently named 1975's O standing Citizen of Seymour, Wisconsin. After receiving his medical degree fr Rush in 1923, he founded the Hittner Clinic in Seymour, where he has been active practice for 52 years.

Helge M. Janson '24, (Homewood, Illinois) was honored for 50 years of servi to Ingalls Memorial Hospital. Dr. Janson served as the Hospital's president fr 1936-37, and from 1945-46. A portrait of Dr. Janson will be hung in the Inga Medical Library.

Jessie M. Bierman '27, (Lakeside, Montana and Koloa, Hawaii) writes, "aft becoming Professor Emeritus of the University of California at Berkeley in 196 and Visiting Professor at University of North Carolina at Chapel Hill during 19 and '71, I have advanced to the highest rank of all—retirement—after a lovi and very happy career in pediatrics, public health, and teaching and research spend winters in Hawaii and summers in Montana." Dr. Bierman recently pu lished "Impact of Major Health Problems on the Development of Children" *Society, Stress and Disease.* Oxford University Press, London, 1975.

assnotes '32-'37

thanial Reich '32, (New York, New York) was recently featured in the Kings- ok Progress Reporter of the Kingsbrook Jewish Medical Center in Brooklyn, w York. A Consultant in Cardiology at that institution for 30 years, Dr. Reich's ny accomplishments are listed in "Who's Who in America," and "Who's Who the World." Dr. Reich's avocation is surrealistic painting which has been the ject of ten, one-man shows around the country and at the Museum of dern Art in Paris. Four American museums count his paintings among their manent collections.

te H. Kohn '35, (Chicago, Illinois) has been named chairman of the depart- nt of rehabilitation medicine at Medical Reese Medical Center. She is the first, -time, woman chairman of a medical department at the hospital. Dr. Kohn was merly medical director of Schwab Rehabilitation Hospital.

R. Cortesi '37, (Villa Park, Illinois) was presented with a certificate of Ap- ciation for 20 years of service to the Villa Park Fire Department. The plaque s presented to Dr. Cortesi for his "outstanding contribution of time and knowl- ge to the fire Department Emergency Medical Program." Dr. Cortesi is im- diate past president of the medical staff of Memorial Hospital of DuPage unty, Elmhurst.

mes D. Stratton '37, (Charlotte, North Carolina) reports that he has just shed his term as President of the Mechlenburg County Medical Society in rth Carolina. Dr. Stratton practices ophthalmology in Charlotte, North Carolina.

assnotes '73-'75

arles Hollander '74, (Chicago, Illinois) and **Mark Lurie '73** (Los Angeles, lifornia) are contributors to the recently published "The Use of Non-Invasive thods in the Evaluation of L.V. Performance in Coronary Artery Disease". The icle appeared in the *American Heart Journal,* August, 1975.

hard E. Melcher '75, (Chicago, Illinois), a resident in Family Practice at West urban Hospital in Oak Park, Illinois was guest speaker at the hospital's Med- Explorers group in October. Dr. Melcher spoke on the role of West Subur- 's Family Practice Center in preparing young students for medical careers.

COMMENCEMENT

e commencement ceremonies Rush University will be con- cted at Orchestra Hall on June 1976 at 2:00 p.m. Graduates m Rush Medical College, the llege of Nursing, and the College Health Sciences will receive de- es at this occasion. On June 11, 76, The Alumni of Rush Medical llege will welcome the new med- graduates to membership at a nquet scheduled for 6:00 p.m. at Drake Hotel.

In Memoriam

Louis Clayton Allard '42
Ernest R. Anderson '25

Milton O. Beebe '40
F. Temple Burling '23

Leonard Cardon '29
Joseph H. Chivers '17
Henry H. Conley '24
Arthur L. Copper '32
Marion C. Corrigan '31

Ethel M. Davis '19
John Wesley Davis '33
James Marshall DePue '33
Cecil C. Draa '32
John S. Duncan '27
Charles Dunham '33

Lewis J. Ferrell '30
Thomas Findley '28
Joseph P. Fitzgibbon '32
Earle B. Fowler '10

Wayne Gordon '30

Charles O. Harris '29

Spencer Johnson '29
Noble Wiley Jones '01

Belle F. Korman '25
Gerard N. Krost '14

Erling N. Larsen '27
James P. Lovett '32

Albert Gould Martin '35
Lemuel C. McGee '30
William M. McMillan '26
John Paul Medelma '30
Frank P. Miller '16
Jay M. Milligan '20
Clarence Minnema '32
William M. Moffat '24
Benjamin F. Morton '33

Sam Edward Namminga '35
Milton A. Newman '42

James Orr '15
Marie Ortmayer '17

Charles E. Palmer '12
Robert H. Parker '37
Elbert S. Parmenter '21
Clifford J. Pearsall '20

James T. Rooks '10
Edmund C. Roos '16
Gordon Rosene '22

Henry Charles Sauer '19
Samuel C. Schmitt '01
Francis J. Scully '15
Bertha M. Shafer '17
Mary V. Sawyer Sheppard '31
Leonard Richard Sillman '37
Frederick W. Slobe '17
Otto E. Strohmeier '37

Nicholas Linn Tartar '21
Harold L. Thompson '23

Howard V. Valentine '35

Earle Edward Wilson '33
Pake Harold Woodward '29
Bertrand O. Wood '24

Arthur R. Young '32

Robert E. Zellner '40
Nelson Zivity '34
David J. Zubatsky '34

SOMETHING OLD AMONG THE NEW

When all the steel and concrete and glass of the new academic facility are in place, a simple red brick will hold a place of honor in it.

The brick is older than the United States; it was once part of the home of Benjamin Rush, M.D., father of American psychiatry, who two hundred years ago was serving as a member of the Continental Congress and helping to draft the Declaration of Independence, which he signed the following year.

The brick was presented to Rush University October 21, 1975 by Jack Weinberg, M.D., professor and senior attending physician in Psychiatry, on behalf of the American Psychiatric Association (APA), of which he is treasurer.

William F. Hejna, M.D., dean of Rush Medical College and vice president for Medical Affairs, accepted the gift in ceremonies at a special meeting of the Antiquities Committee.

In making the presentation, Dr. Weinberg explained how the gift was obtained three years ago. William F. Kona, M.A., chairman of the Antiquities Committee and director of the Rush University Library, began a campaign to secure Benjamin Rush memorabilia. Patrick Ebenheoh, M.D., Psychiatry, suggested that Dr. Weinberg, as an APA officer, might help. The APA is raising funds to restore the Benjamin Rush home, demolished through an error in 1969 after standing for 280 years. It chanced that the then-President of the APA, Daniel Blain, M.D., a Philadelphian, had driven by the site when the wrecking crew was at work, rescued the materials, and had them stored on the grounds of the Philadelphia State Hospital. The APA then began to raise funds for reconstruction. Dr. Weinberg obtained the brick, which was certified by Dr. Blain, now assistant superintendent of the Philadelphia State Hospital, as being part of the original construction of Dr. Rush's home.

In accepting the gift, Dr. Hejna pointed out how much of what Benjamin Rush wrote has contemporary application, and thanked Dr. Weinberg on behalf of the Medical Center.

The brick is now in the Library, and will be on permanent exhibit when the Library moves to the new academic facility this year.

The birthplace of Benjamin Rush in Philadelphia will be restored in time for the U.S. bicentennial celebration. The home was accidentally demolished in 1969 after standing for nearly 280 years.

A $38 million building program, largest in Medical Center history, will culminate during this Bicentennial year. The first new building for Rush University, the academic facility, will be ready for classes in late summer and will house educational and research activities for all colleges of the university. Rising just to the south of the academic facility is the Johnston R. Bowman Health Center for the Elderly, scheduled to open in the fall. A new parking structure also is nearing completion on the West Side campus of the Medical Center.

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The Magazine

Cancer:
Advances in treatment and
research have improved
the life expectancy of
the cancer victim

Winter 1976-77

The Magazine

of Rush-Presbyterian-St. Luke's Medical Center
volume 9, number 2, winter 1976-77

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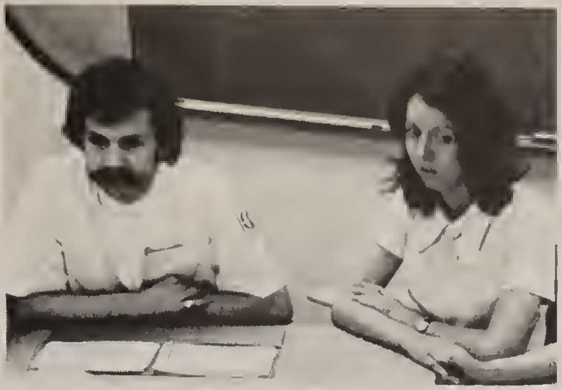
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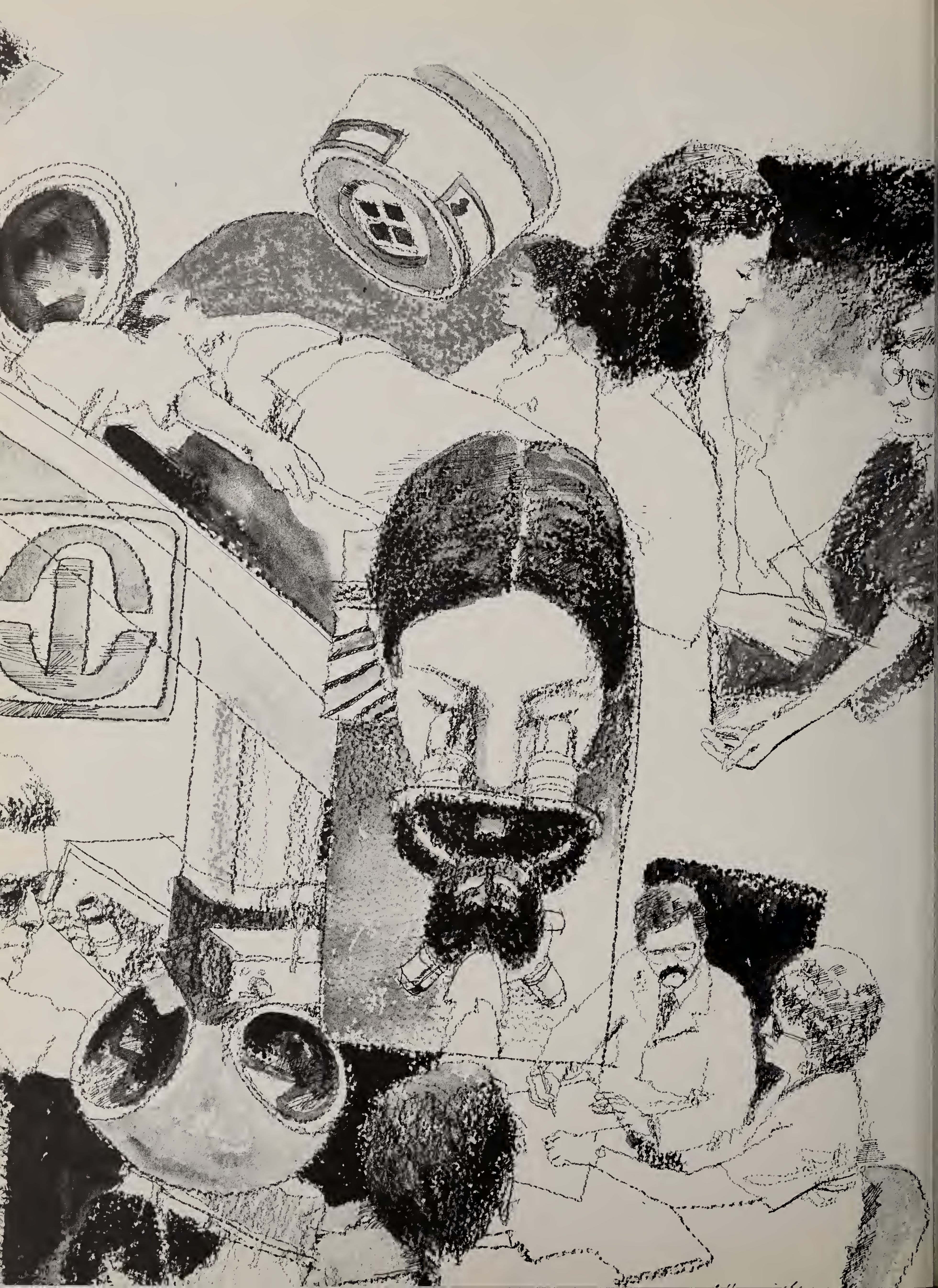

Cancer:

Until the last few decades, a diagnosis of cancer was a sentence to a quick death. With each passing year, however, new surgical and radiotherapeutic techniques, powerful new drugs, and new uses for familiar drugs have greatly improved the life expectancy of the cancer victim.

At Rush-Presbyterian-St. Luke's Medical Center, one of the nation's foremost cancer treatment and research centers, more than a dozen departments are working cooperatively to develop new approaches to combat cancer. Announcement of a $2 million pledge by the Woman's Board to establish a Cancer Treatment Center makes timely this survey, written for laymen and professionals alike, of the Medical Center's multi-disciplinary efforts in the cancer field.

By Helen Frank Bensimon

Cancer. One dread name for 300 diseases. All different, yet all in some ways the same. All characterized by a tumor or growth that starts in one part of the body and gradually spreads until it is stopped or it kills. The tumor is not a foreign substance that invades the body, but an integral part of the body that has gone astray.

There is no one factor that makes normal cells go astray and become cancerous. We know that the environment plays a strong role in triggering some cancers. We know that cigarette smoking is linked to lung cancer, yet many smokers don't get lung cancer, and some non-smokers do. We know that overexposure to sunlight is associated with skin cancers and that there are dietary factors associated with colon and stomach cancers. We know that women with certain characteristics are at risk for breast cancer. We know that certain risk factors are associated with testicular cancer, bladder cancer, and cervical cancer. But for every theory that explains how a cancer is caused, there are countless exceptions.

Sometimes cancer can be stopped by surgery, or radiation, or potent drugs, or a combination of some or all of these treatments. However, if even a few tumor cells elude treatment, they will form new tumors. This is metastasis, or spread, the most fearful aspect of cancer. Even when the growth seems to have been stopped successfully for many years, a new growth that has been forming slowly from the cells that escaped may appear in another part of the body. The earlier in its development a cancer is caught, the smaller it will be, and the less chance there will be for some cells to elude treatment. Once the cancer cells have spread from one part of the body through the blood and lymphatic systems to another part, it is most difficult to arrest the disease.

Cancers usually are classified by the organ in which they originate and by the kind of cell that is involved. Different cancers have different causes and are treated differently. Roughly half of all cancer deaths are caused by cancers of three organs: the lung, the large intestine, and the breast.

Until the last few decades, a diagnosis of cancer was a sentence to a quick death. With each passing year, however, new surgical and radiotherapeutic techniques, powerful new drugs, and new uses for familiar drugs have greatly improved the life expectancy of the cancer victim. There is no single cure for cancer. Success of therapy is measured in years of disease-free survival. Hodgkin's disease, a lymphatic cancer, used to have an 85 percent death rate. Today it has an 85 percent five-year survival rate, if caught early. Malignant melanoma, a skin cancer that used to be called the "black death," had a 20 percent survival rate 15 years ago. Today, if caught early and treated aggressively, the survival rate for five years is 80 percent. Dramatic, long-term remissions are being achieved in childhood leukemias with new, more aggressive therapy.

But lowering the death rate is not enough. There is also a growing emphasis on assuring that the quality of the life that is saved is not hopelessly impaired.

"Longevity without comfort is not an acceptable end point," says Frederic A. dePeyster, M.D., Professor of Surgery at Rush-Presbyterian-St. Luke's Medical Center, who specializes in treating colon and rectal cancer.

Yet patients must contend not only with the discomforts of the disease process but with many more

In surgery

discomforts that are caused by the treatments to arrest this process. Surgery may leave the patient without a vital organ, such as the colon or the bladder, forcing radical changes in lifestyle. Radiation therapy may damage healthy tissue as it kills cancerous tissue. Chemotherapy, the administration of potent anti-cancer drugs, brings unpleasant side-effects, such as severe nausea, weakness, and loss of hair.

"For patients in therapy, every day is different," says Myra Levine, S.B., M.S.N., Associate Professor of Nursing at Rush University, who directs the only graduate training program in Illinois for nurses specializing in cancer care.

"The issue is not what is it like to live with cancer, but what is every 24 hours of every patient's life going to be like. Cancer patients want the same thing that any other patient wants. They want to be the way they were before they got sick. They want to be autonomous. They don't want to be heroes, or heroines, or invalids. We have to deal with the problems of their daily living."

For the health professional who specializes in treating cancer, there is also a serious emotional wrench. He or she sees a patient frequently over weeks, months, or even years. An unusually close relationship is forged as they fight together to save the patient's life. And then the patient dies.

"You have to come to grips with death before you become an oncologist," says Robert E. Slayton, M.D., Professor of Medicine, who is a medical oncologist, a specialist in drug therapy for cancer care.

"The hardest part is recognizing when there's nothing more you can do for the patient. Too often, dying patients are kept alive by blood transfusions, antibiotics, and intravenous fluids by well-meaning but misguided physicians who, in prolonging life, are simply prolonging death."

Solomon Adler, M.D., Assistant Professor of Medicine, who specializes in treating patients with blood cancers, says he tries to take an optimistic view. "We realize that many of our patients may die, but many will live for a long time or even be cured. We attempt to cure every patient. No matter how poor the prognosis, we make every reasonable effort to cure the patient."

Medical, scientific, and social support systems have been established around the country to develop new treatments for cancer; to achieve a better understanding of how cancer works, in the hope of curing or even preventing the disease; and to promote the physical and emotional rehabilitation of cancer victims. As one of the foremost cancer centers in the Midwest and in the nation, Rush-Presbyterian-St. Luke's Medical Center embodies a sensitive combination of these armamentaria in the war against cancer.

The Medical Center has long been associated with pioneering work in cancer research and treatment. Some of the major advances in treatment of colon cancer were made here in the 1930s. One of the nation's first tumor clinics, a regular meeting where physicians could discuss their cancer cases and offer one another advice on treating them was established at the Medical Center in the 1940s. The Medical Center has also pioneered in systemic treatment (whole body treatment using drugs) for cancer.

Until the 1940s, the only therapy for cancer was surgical excision of the tumor and some limited radiation therapy. With the development of a hormonal treatment for cancer of the prostate by Nobelist Charles Huggins, M.D., of the University of Chicago, a new era of drug therapy for cancer began. Today surgery and radiation therapy are still the most common treatments for cancer, but they are increasingly being supplemented by powerful anti-cancer drugs.

In the 1940s, Samuel G. Taylor III, M.D., a young endocrinologist at Presbyterian Hospital, was conducting research into the nature of hormones. Following Dr. Huggins' lead, he began treating some cancer patients with hormones and carried out some of the nation's first studies on the use of hormones in treating breast cancer. From that time on, he began to specialize in the treatment of cancer patients. About a decade later, he was joined by Charles P. Perlia, M.D., a Swiss-trained physician who had come to study with him on a one-year fellowship in Endocrinology. Dr. Taylor assigned him to his cancer cases. The emotional and professional frustration of dealing with so many hopelessly ill patients was too much for Dr. Perlia. At the end of the year he left to take up a residency in internal medicine. But ordinary medicine held no challenge for him after that year in cancer care. He decided to go back and devote his career to cancer treatment and research.

"Cancer takes in the whole scope of human biology, biochemistry, and physiology," says Dr. Perlia. "There is no greater challenge."

Dr. Perlia became Chairman of Rush's Section of Medical Oncology in the Department of Medicine in 1971 when Dr. Taylor retired, and was recently named the Samuel Taylor III Professor of Medical Oncology.

In 1958, Dr. Taylor and Dr. Perlia pioneered in the use of adrenalectomy (removal of the adrenal glands, which secrete hormones) in

> *"There has always been a close relationship here among the surgeon, the oncologist, the internist, and the therapeutic radiologist."*
> *—Samuel G. Taylor III, M.D.*

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eft to right: Charles P. Perlia, M.D., Samuel G. Taylor III rofessor of Medical Oncology; Samuel G. Taylor III, Professor f Medicine and Acting Director, Illinois Cancer Council; and Frank R. Hendrickson, M.D., Professor and Chairman, Department of Therapeutic Radiology and Acting Director, Rush Cancer Center.

he treatment of breast cancer, orking in collaboration with Dr. uggins' group at the University of hicago, and published one of the irst scientific articles on the subect. Not long thereafter, Presbyteran-St. Luke's Hospital became the irst institution in the Midwest to stablish a Section of Medical Onology.

"What's so unusual about this intitution," says Dr. Taylor, "is that ystemic treatment of cancer was egun in Medicine, not Surgery. In ost other institutions, departents of medicine disliked cancer o much that they just made diagoses and dumped the problem on he surgeon. Here, the Department f Medicine has been intimately asociated with cancer care from the eginning.

"There has always been a close relationship here between the surgeon, the oncologist, the internist, and the therapeutic radiologist," he says. "The cancer program at Rush was one of the first places where the multidisciplinary approach to cancer treatment that is being stressed now was developed."

In 1971, the passage of the National Cancer Act brought about a dramatic change in the focus of cancer research and treatment in the nation. The National Cancer Institute was re-structured as an independent entity within the National Institutes of Health in the Department of Health, Education and Welfare to oversee the "War on Cancer." One of the requirements of the new law was that the Surgeon General designate 15 comprehensive cancer centers within the United States. The announcement set off an immediate scramble for funds among the major cancer centers in the country. Rush, the University of Chicago, and Northwestern University all drafted proposals for planning funds. But then things took a different twist.

"At the time," recalls Dr. Taylor, "we didn't really know what a comprehensive cancer center was. We did know that none of us wanted to do the whole thing alone. Here at Rush, we felt that the project would be more effective if we all got together. So we set up informal meetings among the three institutions, and we agreed to set up an independent central organization for cooperative efforts in research and patient care on a statewide basis. The

Diagnosing the cancer

Illinois Cancer Council was formed as an umbrella organization. It is one of the strongest comprehensive cancer centers in the country, drawing on the resources of its member institutions, four of which have been designated as specialized cancer centers. The cancer programs of the other medical schools in the state are in various stages of development."

Meanwhile, the Rush Cancer Center was established as a kind of administrative catalyst to coordinate the Medical Center's multimillion dollar, multidepartmental effort in cancer treatment and research, offering administrative, educational, and other support services. One of the Cancer Center's most important educational efforts has been to bring the latest information about cancer treatment to the physicians in the 10 community hospitals around the city and the state that are part of the Rush hospital network.

"We don't try to bring the community to the Cancer Center," says Frank R. Hendrickson, M.D., Chairman of the Department of Therapeutic Radiology and Acting Director of the Center. "We bring the Cancer Center to the community."

Senior specialists in cancer treatment from Rush visit the affiliated community hospitals each week, seeing some patients, teaching house staff and other physicians and nurses, and involving physicians in the community hospitals in clinical research projects.

"What this outreach does for the patient at the community hospital level," says Dr. Hendrickson, "is that wherever the patient contacts the Rush system he is able to have the benefit of the most advanced knowledge about his disease. The Cancer Center is now conducting a study to evaluate the improvements in patient care that have resulted from this intensive, high-level outreach effort."

"If you don't know how well you're doing, you don't know how to improve," says Steven G. Economou, M.D., Professor of Surgery, who coordinates the Cancer Center's Tumor Registry program.

The Registry contains detailed information on each case of cancer treated at the Medical Center since 1954, including detailed follow-up information. The records of the Registry indicate the primary site, additional involvement, type of treatment, and results of therapy for the more than 20,000 patients whose cases have been recorded since 1954. Some 6,500 cases are followed by the Registry each year, with 1,400 to 1,500 added annually. The Registry is organized to conform to the requirements of the American College of Surgeons Commission on Cancer, which accredits tumor registries around the country. One of the many criteria for accreditation is an annual follow-up of at least 90 percent of the patients to ascertain the status of their disease. The Registry annually sends out questionnaires to physicians and patients to get this information. The questionnaire packet also contains a special data sheet to evaluate the quality of the patient's life.

The object of gathering and computerizing this enormous body of material is to establish patterns of appearance of cancer and patterns of success and failure of treatment.

Physician education is an important benefit of the Registry and an important focus of the Cancer Center. Dr. Economou and some of his colleagues are evaluating the Rush Medical College curriculum in oncology.

"The teaching of oncology should start in the earliest years, rather than after the doctor is in practice," he says. Each week there are also more than 20 specialty conferences coordinated by the Rush Cancer Center, covering every aspect of cancer treatment and open to physicians and students both at the Medical Center and the network hospitals.

Early detection of cancer—before it has had a chance to spread—is the key to arresting it. However, since many cancers have virtually no symptoms until they are very far advanced, early detection is difficult. Rush has recently received a grant from the American Cancer Society, Illinois Division, to establish a health evaluation program that will offer a detection program for cancer and other diseases. It will be different from other cancer screening programs in that it will seek to identify high-risk patients and provide additional screening and health counseling for them.

The ACS has also granted Rush $120,000 over a three-year period to set up a professorship in early detection, to enable the institution, through its medical college, to train future physicians in this area.

Once a cancer is suspected, a sophisticated diagnostic effort begins. Where is the cancer? A patient's brain tumor actually may be a cancer that has spread from the lung or the breast. A bone cancer may be metastatic from other organs. Often the metastatic tumor is found first, and the primary tumor cannot be identified.

"One of our most difficult jobs is to identify the primary cancer," says oncologist Janet Wolter, M.D., Associate Professor of Medicine. "You can't treat the disease properly unless you know where the primary tumor is."

Precise diagnostic tools can reveal, for example, that a tumor should not be surgically excised, but should be treated with radiation

"Any test. . .may be 90 percent accurate, but each test has some errors. The more tests you do, the more accurate you can be."

—Richard E. Buenger, M.D.

therapy or chemotherapy. The more precisely a tumor is identified, the more effectively the surgeon and therapeutic radiologist can treat the tumor, with the least possible damage to the surrounding healthy tissue.

"Every exam we do in the Department of Diagnostic Radiology is a potential exam for cancer," says Richard E. Buenger, M.D., Chairman of the Department. "We have a special test for any tumor that can be identified by x-ray." The Department is divided into several sections, each specializing in administering and evaluating diagnostic tests for specific parts of the body, to provide greater precision in diagnosis. There is also a section of pediatric radiology, and sections specializing in two new techniques, ultrasound and computed tomography.

Ultrasound is a form of mechanical vibrational energy with a frequency well above the normal audible limit of 20,000 cycles per second. The high velocity sound beam goes through the body and gives off echoes that are translated into images and can indicate the presence of a tumor. Computed tomography is a new imaging system that provides cross-sectional picture "slices" at different levels of the body. Rush currently has two EMI brain scanners and one total body scanner, representing a $1.5 million investment in this sophisticated diagnostic capability.

"Any test you do may be 90 percent perfect," says Dr. Buenger, "but each test has some errors. The more tests you do, the more accurate you can be. Accuracy is critical to every aspect of cancer diagnosis."

Rush also has facilities for mammography, the controversial radiologic exam for breast cancer, which is able to detect tumors before they are palpable. While it is agreed in the medical community that the very early stage of the cancer revealed by mammography dramatically lowers the death rate from breast cancer in women over the age of 50, there is currently some controversy that the amount of radiation emitted in annual mammograms may be dangerous to women under 50.

Franklin S. Alcorn, M.D., Professor of Radiology, is among the growing number of physicians whose research and experience has convinced them that mammograms are safe and that the advantages of mass screening and early detection of breast cancer far outweigh any possible disadvantage. He and Laurens V. Ackerman, M.D., Assistant Professor of Biomedical Engineering, are attempting to computerize mammography screening. Dr. Ackerman has developed a computer program that makes it possible to divide mammograms instantly into suspicious and nonsuspicious films, thus saving about 90 percent of the radiologist's time and greatly increasing the number of women who can be screened by this method. He is now testing his program in a retrospective study of 5,000 mammograms.

Sometimes tumors cause a change in body structure. Other times they cause a change in function. While structural changes can be detected through diagnostic radiologic techniques, functional changes may be detected through nuclear medicine techniques.

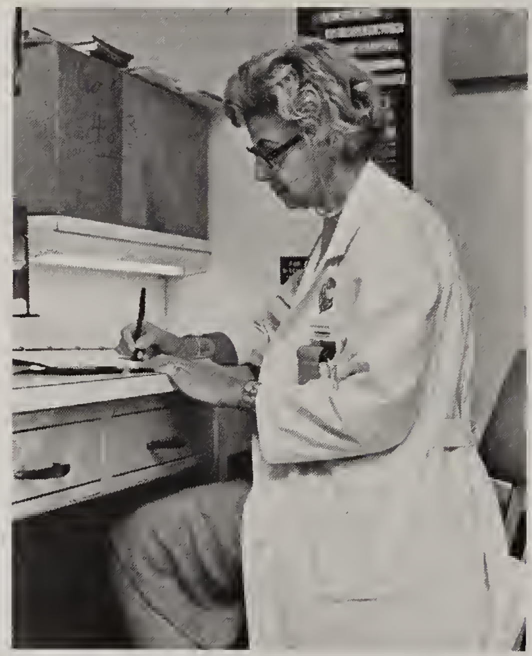
The patient is injected with radiopharmaceutical agents that circulate in the blood until the target organs remove them from the blood. Different radiopharmaceuti-

Continued on page 12

Victor Mategrano, M.D., explains whole body scan to patient.

Janet Wolter, M.D.

Treating the cancer: You have to be a born optimist



Janet Wolter, M.D.

Early Wednesday mornings, while their patients are having breakfast, Janet Wolter, M.D., and her colleagues in Rush-Presbyterian-St. Luke's Section of Medical Oncology (cancer care) meet in a small conference room on the eighth floor of the Professional Building on the Medical Center campus.

The details under discussion vary with each meeting. But the major questions are always the same:

How can we save this life?

How can we make this patient more comfortable if this life cannot be saved?

In the course of a week, there are more than 20 such cancer conferences at the Medical Center.

The six oncologists, six postgraduate fellows, and two nurses discuss their problem cases. There is no false pride. A senior oncologist presents a case and says simply, "What do you think I should do?"

Most of the cases are especially difficult because treatment has already been attempted elsewhere and has failed. By the time the patients are referred to Rush, their cancer may have metastasized, or spread, to many parts of the body. Despite this bleak situation, every effort is made to try to arrest the disease.

"You can't be an oncologist unless you are a born optimist," says Dr. Wolter.

There are many cases to be discussed this Wednesday morning; a 30-year-old man with metastasizing testicular cancer; two breast cancer patients, one of whom has a spread of cancer to the opposite breast; a lymphoma patient whose enormous tumor must be shrunk by radiation or chemotherapy before the extent of the disease can be evaluated; a patient whose ovarian tumor has been removed, but who is on renal dialysis three times a week, making it difficult to administer anti-cancer drugs. Together, the oncologists decide on an individualized course of treatment for each of the patients.

The meeting over, Janet Wolter goes back to her small office and puts on a white lab coat sporting a huge "Cub Power" button over her fashionable red and white print dress. There is already a large pile of telephone messages on her desk.

"Part of what an oncologist does is answer the telephone," she says with a grin. "We talk, talk, talk."

A number of the calls are from physicians in other parts of Illinois who seek her advice. There are many calls from patients. She is generous with her time as she speaks to them, listening to their problems, reassuring them, calming their fears.

The relationship between oncologist and patient is an unusually close one because they see each other so often. But it is also a very difficult one for the physician.

"You have to prepare yourself from the beginning for the fact that some of your patients are going to die," says Dr. Wolter.

"You start preparing yourself from the moment they walk into the room. But you do develop a close relationship with these patients. You invest a great deal of yourself in the relationship. You just have to keep working things out all the time. I sometimes go home and cry. It's a normal grief reaction. My husband understands.

"The only time it's unmanageable is when you lose several patients at a time, or when they die of other causes. I treated one patient with melanoma for four years and finally, after all that time, I was able to give him a clean bill of health. The next day he was killed in a traffic accident. That was very difficult. We were not prepared."

It is 9 a.m. Dr. Wolter goes to make the rounds of her patients in Presbyterian-St. Luke's Hospital. She is accompanied by Gary Steinecker, M.D., a young internist in the second year of a two-year fellowship to study oncology; Bonnie Morrin, R.N., a nurse trained in the Medical Oncology Section in the special needs of cancer patients; and a Downstate surgeon who makes rounds with Dr. Wolter once a month as part of his continuing education in cancer care. Dr. Steinecker says he has learned a great deal of medicine since he began working Dr. Wolter. "But I've learned even more about dealing with people."

At the elevator they greet a cheerful, robust young man who has just been in for a checkup. Ten years ago, he was treated for Hodgkin's disease, a lymphatic cancer. The disease has not recurred. He is as close to being "cured" as a cancer patient can get.

At the hospital, Dr. Wolter and her associates head for the Department of Diagnostic Radiology on the first floor to study her patients' latest x-rays before going on rounds. She finds the x-rays of a 19-year-old who has a tumor on his spinal cord. It is not clear whether this is the primary tumor or whether there is a tumor elsewhere that has spread to the spinal cord.

"Often correct diagnosis is the most difficult part. If we always knew what people had, we'd really be ahead. Sometimes you have to take a flyer on the probable diagnosis and treat accordingly," she says.

She looks at some x-rays of the boy taken the previous day. At first a spot near the kidney was believed to be the primary tumor, a kidney tumor. Now a radiologist explains that the spot is actually a rare vein defect. They are back at square one. She orders an examination with the EMI body scanner, an imaging machine that provides cross-sectional picture "slices" at different levels of the body. This offers the final hope of finding out where the primary tumor may be. Dr. Wolter, Dr. Steinecker, and Mrs. Morrin go through x-rays of the other patients. The beeper in Dr. Wolter's right pocket buzzes frequently and she stops to answer calls from patients.

Finally all four walk up to the second floor. An intern rushes up with news that visibly shocks them. Susan, a brilliant young scientist whose neck cancer has spread to the bone, has suddenly become paralyzed. Susan's emotional state is precarious because of her severe bone pain and her acute consciousness of the gravity of her condition.

Left to right: Janet Wolter, M.D., Gary Steinecker, M.D., and Bonnie Morrin, R.N., prepare to make rounds.

Bonnie Morrin, R.N., administers chemotherapy treatment.

She is under psychiatric care. Dr. Wolter immediately orders a myelogram, a radiologic diagnostic test that will assess whether the spinal cord is blocked or whether Susan's paralysis is the result of hysteria. A spinal cord block is a medical emergency necessitating immediate treatment to prevent permanent damage. Dr. Wolter stops in alone to see Susan and to try and calm her. She is distraught, frightened, and angry. She does not want to be calmed.

They move on to see the young man who needs the body scan. He is watching a rock show on television and is in good spirits. When he entered the hospital he could not walk. Now, through radiation and chemotherapy, the tumor has been shrunk, and physical therapists have helped him learn to walk again. He feels that he is getting better, and he wants to go home. Dr. Wolter jokes with him, tells him that he'll have to stay just one more day for the body scan, and explains why it is necessary.

Before going up to the next floor, she calls to see if Susan's myelogram has been completed yet.

On the third floor, one of her patients is comatose and close to death. His melanoma has metastasized to the brain. He has a raging fever. His wife and daughter, both distraught, hover around his bed. His wife is swabbing his brow with ice cubes in a futile attempt to bring down the fever. Dr. Wolter speaks to them briefly, trying to offer some comfort.

"It's always hard on the physician when a patient dies," she says later. "It helps to be able to comfort the family. But when I know I have nothing more to give and the quality of the patient's life has deteriorated hopelessly, then I'm relieved when he dies."

On the fifth floor they visit a breast cancer patient whose disease has spread to the pleural cavity, causing fluid to gather around the lung. She is frail and looks much older than her 47 years. Her room is surrounded by photographs of her children and grandchildren.

"I'm not concerned about cancer," she tells the doctors and nurse. "I'm worried about my family." She is afraid to go home because, "as soon as you go home you're a mother. You start doing the housework and washing the dishes." Dr. Wolter promises to speak to her husband and explain to him his wife's need for rest. Mrs. Morrin promises to arrange for a housekeeper for the family.

There are a few more patients to visit, and then everyone goes back to Diagnostic Radiology. Susan's myelogram has been completed. A tumor is blocking her spinal cord. Treatment must be immediate. Her poor physical and emotional condition will make surgery risky. However, Dr. Wolter contacts a neurosurgeon and asks him to evaluate the situation.

There is a quick break for lunch, and at 12:15 p.m. Dr. Wolter heads for one of the many committee meetings she attends as a faculty member of Rush Medical College. This meeting is of the Committee on Evaluation and Promotion, where standards for promoting medical students are discussed and decisions are made on individual cases.

Back in her office, telephone messages are spread out on her desk, in addition to a pile of charts for the patients she will see that afternoon. Several of the telephone messages are from Susan. Another is from Susan's psychiatrist. Another one is from the neurosurgeon. Dr. Wolter doesn't have a chance to answer. She no sooner sits down than Susan is on the telephone, venting her anger and frustration. She listens patiently, cautioning her about the risks of surgery, and lets this beautiful, brilliant, talented young woman vent her desperate rage against pain and death.

Dr. Wolter specialized in the treatment of poliomyelitis, at the Poliomyelitis Respiratory and Rehabilitation Center at the University of Illinois until the development of a polio vaccine made the center obsolete. She came to Presbyterian-St. Luke's Hospital in 1958 to work with Samuel G. Taylor III, M.D., and Charles P. Perlia, M.D., primarily in the field of breast cancer, and was trained in the emerging field of chemotherapy.

"The biggest satisfaction has been in knowing that you're doing something very few others can do for the patient," she says. "New things are happening all the time. There's nowhere to go but up."

This Wednesday afternoon, Dr. Wolter sees outpatients in her office in the Professional Building. Bonnie Morrin, the nurse, monitors their weight, blood, and urine, and gives some of them chemotherapy injections. Outpatients may come weekly, monthly, or every few months, depending on their condition.

"All our patients want to be at home, and we try to encourage it if it can possibly be managed," says Mrs. Morrin. "We get them nurses if their insurance will cover it. If patients are super sick on the day they come in, we call to see how they're doing," she says. "If they're really depressed, I call them frequently. If they're home, dying, I call them every day."

All the patients have Dr. Wolter's, Dr. Steinecker's, and Mrs. Morrin's home telephone numbers.

Each outpatient appointment brings with it the same gnawing anxiety. Are the tests all right? Has the cancer spread? With each patient Dr. Wolter is calm and relaxed. No one is rushed, despite the fact that this afternoon's patient load is heavy, and she must be downtown by 4:30 p.m. for an American Cancer Society meeting.

One patient has had two mastectomies and adrenal glands and ovaries removed to stem the spread of cancer. Now a small growth has appeared on her back, a small dark bump. It is metastasis. Dr. Wolter will try a new combination of chemotherapy.

One of the last patients this afternoon is a success story. He is an elderly man whose facial cancer was successfully treated seven years ago. Three weeks ago he had come in with a huge cancerous lump growing like a horn on one side of his head. Dr. Wolter knew this was metastatic cancer but she was unable to find the primary site, although tests with the EMI body scanner suggested the pancreas. She administered chemotherapy and prescribed medication. This Wednesday afternoon the "horn" is almost gone.

"This is fantastic," Dr. Wolter shouts. "This is our reward." She calls in Dr. Steinecker and several other colleagues to admire the improvement.

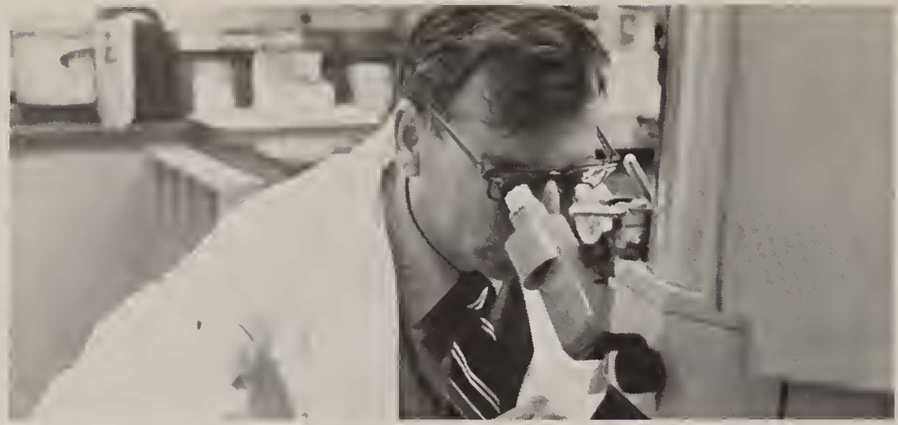
The patient is beaming with pleasure, but he has one question.

"Usually I drink a couple of beers a day. But somebody told me that with the therapy I can't."

"Eat up a storm and wash it down with beer," says Dr. Wolter, laughing.

She begins to gather up her papers for the Cancer Society meeting. There she will help decide which projects should receive research funds. She has spent the weekend reading the proposals. She makes one last phone call to check on Susan.

After the meeting, Dr. Wolter plans to spend a quiet evening at home. Near her telephone.



Pathology study

Continued from page 7

cal agents are taken up by different organs, making it possible to look at a variety of functions.

"The resolution of nuclear scans (films) is terrible," says Ernest W. Fordham, M.D., Chairman of the Department of Nuclear Medicine. "But what we are looking at is function. . . . In order for us to get radioactive materials into that tumor, the tumor has to be doing something that surrounding tissue is not doing, namely functionally taking up material.

"For example, we do routine bone scanning of breast cancer patients. We can pick up metastases to the bone long before they are painful or visible on x-rays by demonstrating the pick-up of radiopharmaceuticals at the site where the bone is reacting to invading tumor."

Once the site of tumor is identified, the precise biochemical nature of the tumor must be ascertained. With solid tumors, this usually means surgical removal of the tumor followed by on-the-spot microscopic analysis as well as both biochemical and biophysical studies.

"We are trying to understand why tumors do what they do," explains Victor E. Gould, M.D., Professor of Pathology. "We want to be able to classify tumors more rationally and understand them better. Since other areas of cancer research are advancing, if we can classify more rationally, we can treat more rationally as more specific anti-tumor agents are developed."

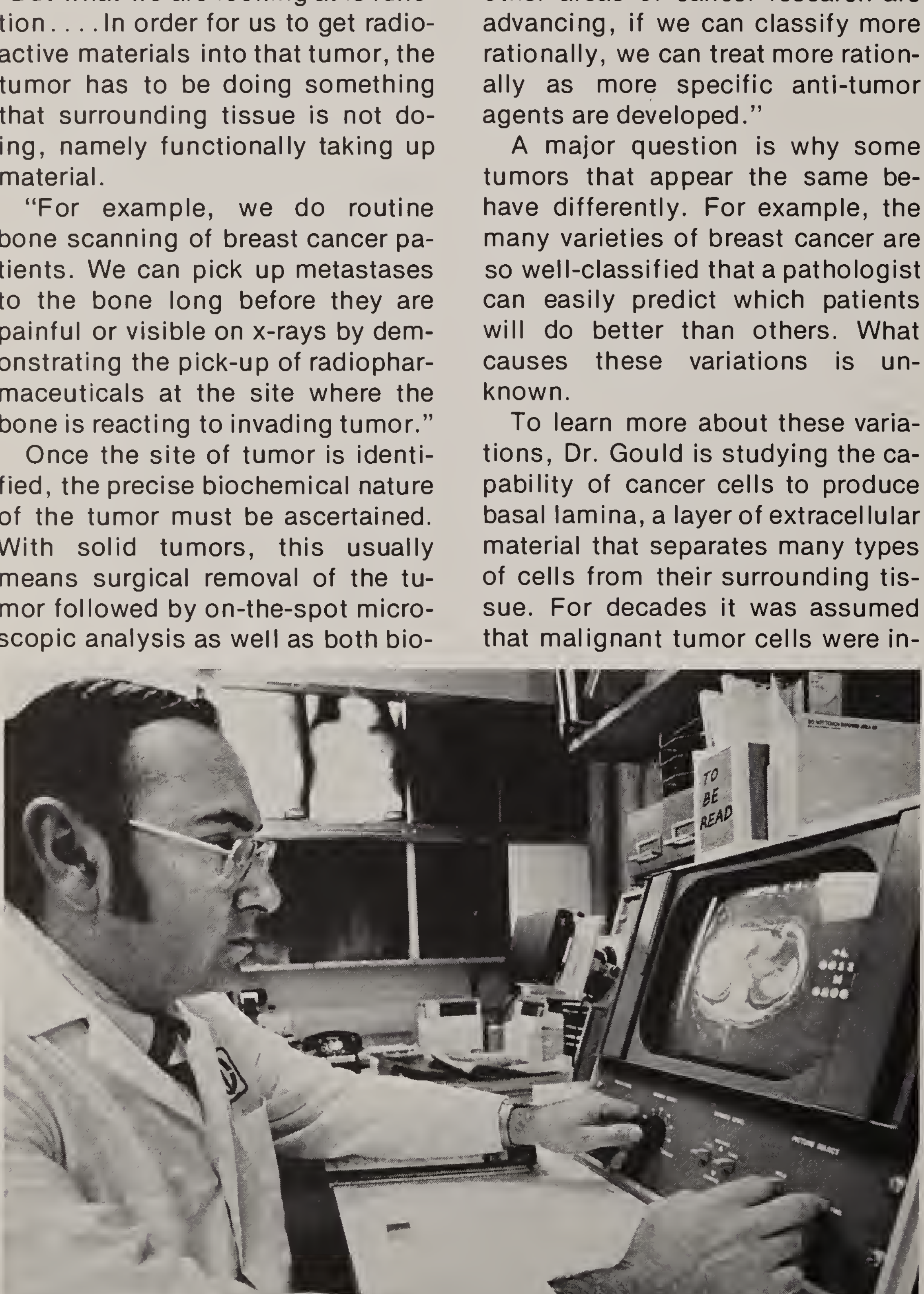
A major question is why some tumors that appear the same behave differently. For example, the many varieties of breast cancer are so well-classified that a pathologist can easily predict which patients will do better than others. What causes these variations is unknown.

To learn more about these variations, Dr. Gould is studying the capability of cancer cells to produce basal lamina, a layer of extracellular material that separates many types of cells from their surrounding tissue. For decades it was assumed that malignant tumor cells were incapable of producing basal lamina. Dr. Gould was one of the first scientists to discover that these cells not only are capable of producing basal lamina, but also in some cases produce an "extreme excess" of it. He has found that the amount of basal lamina a cancer cell produces correlates neatly with whether the tumor will behave in a relatively favorable fashion even if metastasis develops. In some forms of cancer, he found that if the cells had several layers of basal lamina the patients lived disease-free for 10 to 15 years or more after treatment. Investigations are continuing in an attempt to define the precise significance and potential applicability of these findings.

Ronald Weinstein, M.D., Chairman of the Department of Pathology, studies the way malignancies change cell structure, particularly cell membranes and cell junctions, in order to learn which structural changes can give advance warning of a malignancy.

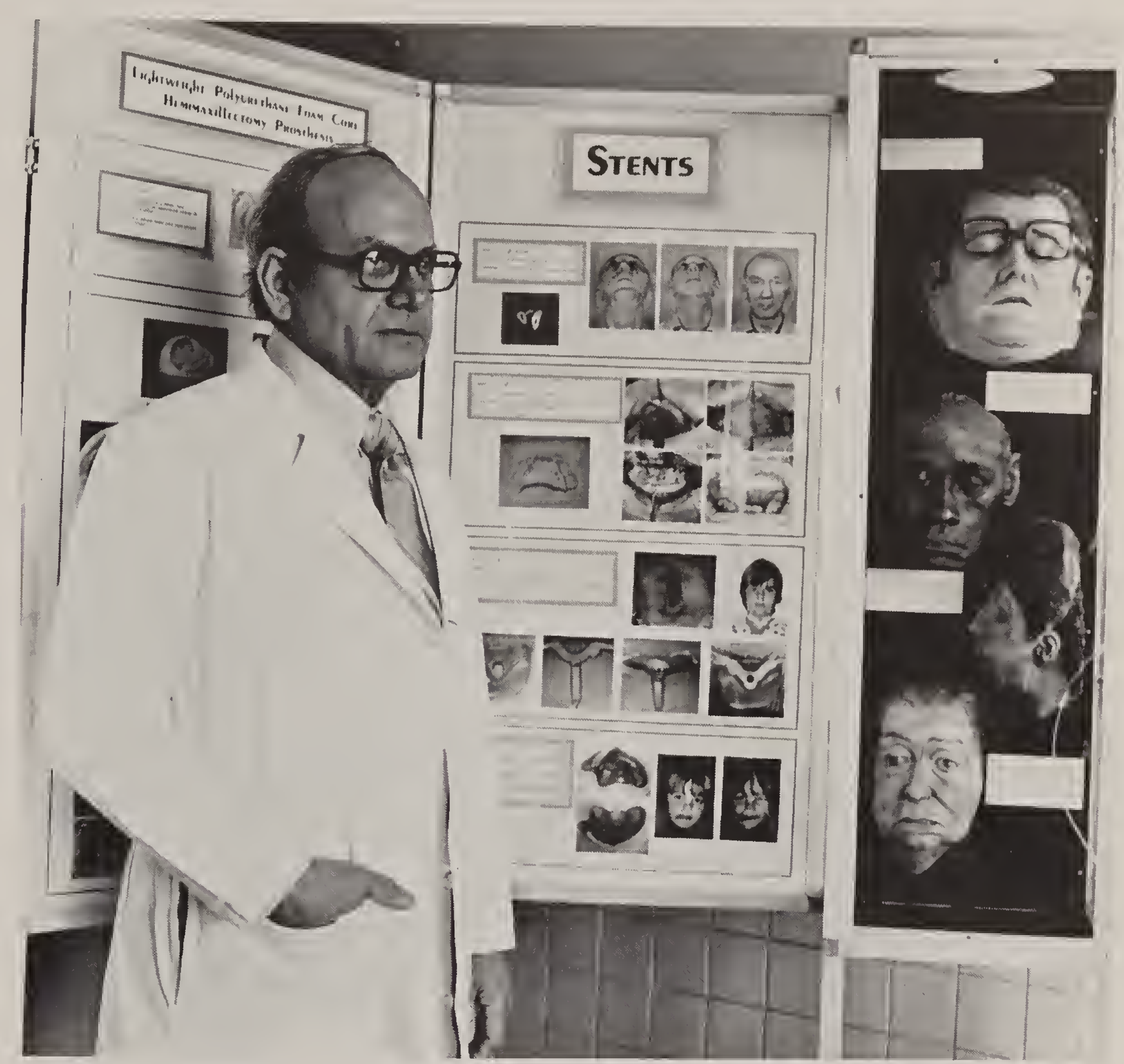
Cell junctions are clearly recognizable membrane components. They provide strong structural links between cells, surface conducts through adjoining membranes of cell pairs, and a means of sealing cells together into coherent tissues that can act as highly selective barriers to bypass diffusion.

Because one or several of these functions may be deranged in malignant tumors, Dr. Weinstein and his colleagues have carried out electron microscope studies to determine if alterations in specific types of cell junctions correlate with specific strategies of malignant transformation. They are studying the possibility that a loss in the frequency of desmosomes



Jerry Petasnick, M.D., at monitor for EMI body scanning unit.

> *"We are trying to understand why tumors do what they do. We want to be able to classify tumors more rationally."*
>
> *—Victor E. Gould, M.D.*


Lightweight Polyurethane Foam Core Hemimaxillectomy Prosthesis
STENTS

Henry O. Gold, D.D.S., with reconstructive surgery display.

(cellular bridges) may play a role in decreased cellular adhesion and may contribute to the potential spread of tumors.

"We are currently attempting to determine if loss of desmosomes is a meaningful predictor of the biological behavior of human bladder tumors, since this would be of considerable importance in diagnostic surgical pathology," he says. He is also studying the differences in the numerical density and two-dimensional topography of certain membrane proteins that may arise in the course of malignant formation.

While surgery is still the most common primary therapy for cancer, few patients are treated by surgery alone. Cancer treatment at Rush invariably involves physicians and scientists in several disciplines working together to determine the best treatment regimen for the patient. In addition, through the Cancer Center, Rush physicians participate with a number of other leading cancer centers in the nation in cooperative study groups evaluating treatment for various types of cancer. For each type of cancer, there are protocols or treatment plans to which participating physicians adhere. Some of the study groups are also testing new drugs.

"No one institution can take care of enough patients to get a large enough patient base to be able to evaluate all the therapies," says Harry W. Southwick, M.D., Chairman of the Department of General Surgery.

"Fortunately," he says, "there are enough knowledgeable people in enough institutions who are willing to cooperate."

Dr. Southwick is one of the nation's leading specialists in treating tumors of the head and neck and sees patients who are referred from many parts of the country. These tumors are frequently treated with radiation for several weeks, to shrink them, before they are removed surgically. Despite this, there can be considerable facial disfigurement. At Rush, there is now a "two-team" approach to treating patients with this problem. A team of oncologic surgeons excises the tumor, and, at the same time, a team of plastic surgeons reconstructs the facial area.

"We used to leave the area open for a year to make sure there was no recurrence before doing reconstructive surgery," says John W. Curtin, M.D., Chairman of the Department of Plastic and Reconstructive Surgery. "Now we reconstruct the defect immediately. The suicide rate among these patients is much less than it used to be. Actually, we do it primarily for functional reasons and only secondarily for esthetic or psychological reasons. We need to make sure that the patient can swallow, eat, and salivate comfortably."

Reconstruction is accomplished by rotating pedicle flaps from the shoulders and forehead. If an entire side of the face is removed, a lining and a covering are needed to replace it. Flaps from the forehead are turned for the lining, and flaps from the shoulder are rotated for the covering.

When a patient has had part or all of some facial structure such as the palate, jaw, nose, or ear removed, prosthetic replacements are necessary in lieu of or until reconstructive

Blood samples

surgery is performed. Henry Gold, D.D.S., Assistant Professor of Plastic and Reconstructive Surgery and Otolaryngology, is a dentist whose specialty is developing artificial devices to replace these natural structures. Such devices, called maxillofacial prostheses, are fabricated out of plastic, metal, and silicone rubber.

"Each patient's needs are different," says Dr. Gold. "We try to meet these needs, whatever they might be."

Dr. Gold is trying to develop different types of attachments so that devices can be removed easily when the patient is examined for recurrences. He is also trying to develop innovative ways of using different materials for better function, esthetics, and quality of life.

"The quality of life can definitely be improved," he says, "but many of these patients still cannot be rehabilitated totally."

One of the most common head and neck cancers is cancer of the larynx or voice box. One form of treatment is partial or complete surgical removal of the voice box. When the entire larynx is removed, patients must be retrained to speak by using the muscles of the pharynx and esophagus.

"There is no single blueprint for treatment," says Stanton A. Friedberg, M.D., Professor of Otolaryngology and Bronchoesophagology and former Chairman of the Department. "Every patient's treatment is individualized. It is mandatory that a doctor establish maximum rapport with his laryngectomy patients. We spend a long time counseling patients, and we never operate until the patient has achieved excellent esophageal speech, so that they know it can be done. I can't overemphasize the need for support," he says. He also notes that invariably patients with this type of cancer are heavy smokers and heavy drinkers, so it is a preventable cancer.

Laryngectomy patients receive special training in esophageal speech from therapists in Rush's Section of Communicative Disorders and through meetings of local organizations of laryngectomy patients. Oncology nurses instruct the patients in the care of their stomas, small permanent openings in the neck through which they breathe.

A comprehensive demonstration project for head and neck cancers, one of 10 regional programs in the nation, is now being coordinated by the Illinois Cancer Council. Funding is provided by the Division of Cancer Control and Rehabilitation, National Institutes of Health. James C. Hutchinson, Jr., M.D., Assistant Professor of Otolaryngology and Bronchoesophagology, co-principal investigator for the project, sees one of its main goals as obtaining information about the various methods used to treat patients with squamous cell carcinoma (cancer) of the head and neck in the hope that this information will enable physicians who treat this disease to ascertain which treatments and combinations of treatments are the most effective.

Other important goals of the project are rehabilitation of the head and neck cancer patient following treatment, and education of the lay public and medical profession in the methods of early diagnosis of this disease.

From the early days when Dr. Samuel Taylor III first used hormones to treat breast cancer, Rush has been renowned as a center for the treatment of this disease, which claims each year the lives of more women aged 40 to 44 than any other illness.

"Despite all our efforts, nationally there is no significant change in the survival of breast cancer patients," says Dr. Perlia.

"I'd like to have more opportunities to get in at the beginning, so that we can prolong life. As a referral institution, too often we get involved at the middle, when someone else has failed."

At Rush, breast cancer is the subject of numerous clinical and basic research studies, and the Medical Center participates in national studies of the disease. Information about all findings are gathered in the Breast Data Collection Service, which, among other things, is developing a profile of women who are at a high risk for developing breast cancer. The data collected cover all types of therapy, laboratory information, and follow-up on all breast cancer patients and can be used by anyone at the Medical Center who wishes to study any facet of breast cancer. Data on some 3,400 patients have been collected thus far and have confirmed recent epidemiological studies done at other medical centers.

"In our series," says William B. Shorey, M.D., Professor of Surgery, who coordinates the service, "the highest incidence of breast cancer has been seen in women who had their first child 25 years after the onset of their menstrual periods. The second highest incidence was in women who never had a pregnancy, and the third most important risk factor was a past family history of breast cancer. Studies done at other institutions have shown that pregnancies in the late teens or early 20s have a definite protective effect.

"Given these risk factors, and given the fact that women are marrying later and putting off having children, we foresee a much greater incidence of breast cancer in the future," Dr. Shorey says.

"The highest incidence of breast cancer has been seen in women who had their first child 25 years after the onset of their menstrual periods."
—William B. Shorey, M.D.

While considerable clinical research is underway, breast cancer is also being studied at Rush at the most basic level. Howard H. Sky-Peck, Ph.D., Chairman of the Department of Biochemistry, with Dr. Perlia and Dr. Economou, is studying cells at the nuclear level to learn how solid tumors grow. He has learned that there can be as much as a 200 percent difference between two areas of one tumor. The outer surfaces of the tumor tend to grow more rapidly than the inner surfaces. Growth is based on calculation of cellular regeneration time, which in turn is based on the metabolism of DNA (desoxyriboneucleic acid). Dr. Sky-Peck is trying to learn the characteristics of regeneration time. Can the natural course of a tumor's growth be altered? If the growth is altered, what portion of its life cycle is responsible for this change? Dr. Sky-Peck is hoping that by knowing which substances affect phases of a cell cycle most, one can affect the natural history of a tumor. He is also hoping to find out which phases of the cell cycle are affected by chemotherapeutic drugs.

"Trying to get precise data in humans is most difficult," Dr. Sky-Peck says. "There is tremendous variability in tumor metabolism in any given individual from area to area and from time to time. We have to study many cellular population changes in order to have a meaningful study of finite changes at the molecular level."

While the past few years have seen a dramatic improvement in the successful treatment of childhood leukemias, improvement has been much slower in the treatment of adult leukemias and other malignancies of the blood in adults.

Adult leukemia is primarily treated with chemotherapy. Hematologists attempt to select, out of some 100 available agents, the one that will be most effective, considering the type of leukemia involved and the stage of the disease. In recent years, there have also been successful efforts to combine several chemotherapeutic agents to effect longer remissions.

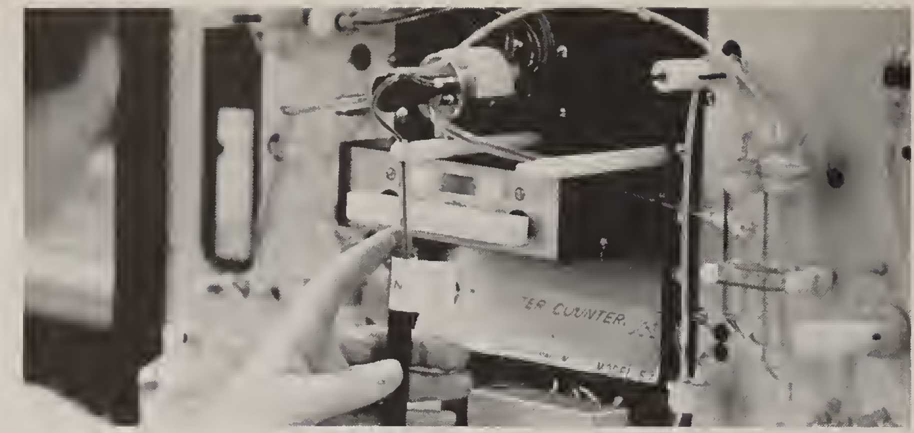
"There have been slow improvements in the number and duration of remissions in acute adult leukemia," says William H. Knospe, M.D., Professor of Internal Medicine and Director of the Section of Clinical Hematology.

"The remissions are not as dramatic as in children, but they are improvements nonetheless. We do have hope. In the last 10 years, the number and duration of remissions have gone up, and, increasingly, the number of patients achieving remissions of two or three years or even longer has increased."

Dr. Knospe and his associates are involved in several national cooperative studies for physicians specializing in blood malignancies, one of which he heads.

One of the most important new projects now being developed at Rush to treat patients with leukemia is bone marrow transplantation. A team is being trained to per-

Howard H. Sky-Peck, M.D., conducts basic research into breast cancer.



Coulter counter analyzes blood

form this delicate procedure, and this may be the only center in the Midwest where it will be performed. The project is a cooperative venture between Rush and the University of Illinois under the Illinois Cancer Council.

"The bone marrow is the body's factory for producing blood," says Dr. Knospe. "Bone marrow transplantation involves a period of intense chemotherapy and radiation therapy to help the patient to eliminate the leukemia cell population. After the preparatory treatment, all the blood cells are gone. You aspirate the bone marrow from a tissue type identical donor, almost always a member of the patient's family, and give it to the patient intravenously. The marrow is removed from the donor under local anesthesia.

"Although the stem cells, which are the cells that form red and white blood cells and platelets, make up only one percent of the material that is infused into the patient, they go to the marrow immediately and begin forming new blood cells. There have been very dramatic successes with these transplants among adult leukemia patients."

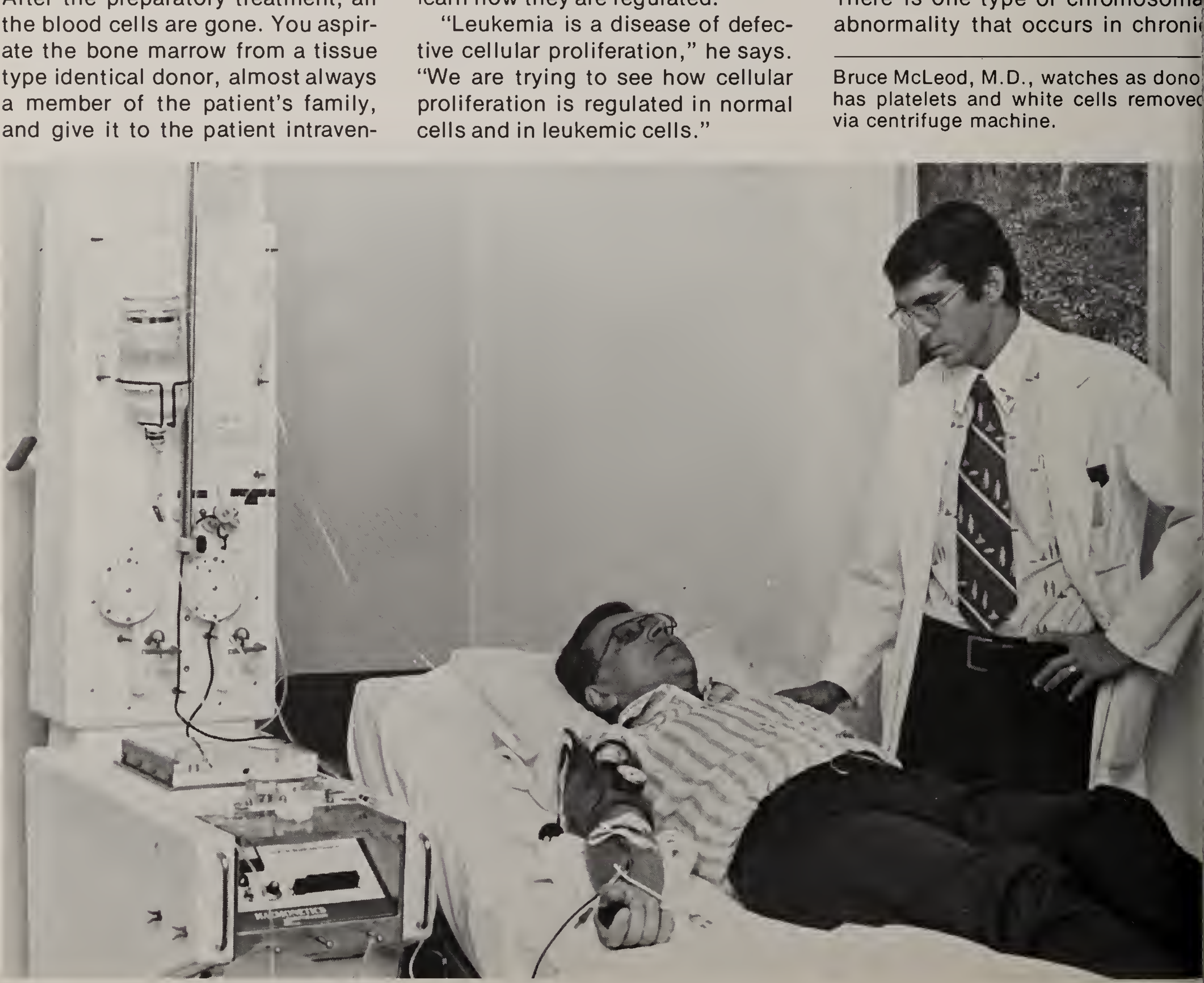
For the past 15 years, Dr. Knospe has been studying stem cells to learn how they are regulated.

"Leukemia is a disease of defective cellular proliferation," he says. "We are trying to see how cellular proliferation is regulated in normal cells and in leukemic cells."

Dr. Knospe and his associate have also conducted studies of th bone marrow "soil," the structura element of the bone marrow. I some patients, bone marrow transplants do not take. In animal models, he has found that this is due t defects in the cells of the bone marrow soil.

Dr. Knospe is also studying th chromosomes of the blood and th way that the genetic apparatus i altered under circumstances of malignancy, particularly in leukemia There is one type of chromosoma abnormality that occurs in chroni

Bruce McLeod, M.D., watches as dono has platelets and white cells remove via centrifuge machine.



"Leukemia is a disease of defective cellular proliferation. We are trying to see how proliferation is regulated in normal cells and in leukemic cells."
—William H. Knospe, M.D.

Lawrence A. Falk, Ph.D., leukemia researcher in Microbiology.

granulocytic leukemia, in which a single chromosome is altered and there is a loss of genetic material from one of the chromosomes, causing it to be smaller, so that it can be used as an identifier of the disease.

"As a result of these and similar studies, we may learn something about how leukemia occurs in its very early stages and how the genetic material of the chromosomes varies as the disease progresses," Dr. Knospe says. He and his associates are also studying chromosome changes in preleukemic disorders, where clues may be found to early changes in the lymphoproliferative genetic material before leukemia is clinically evident or diagnosable as such. Dr. Knospe is also studying myeloproliferative disorders and chronic leukemia in order to find more effective ways of managing them so as to stave off acute or malignant phases. Patients with these disorders can now live 5 to 10 years or longer before the condition becomes acute. A number of studies of new types of combination drug therapy are attempting to determine if the acute or terminal phase can be prevented.

Patients suffering from blood malignancies often need transfusions, since the high doses of chemotherapy they must receive kill many of the normal cells while killing the cancer cells. The blood-forming cells are particularly susceptible to chemotherapy. Ordinary blood transfusions provide plasma and red cells, but a normal transfusion does not offer enough white cells and platelets to satisfy the needs of patients who do not have them.

Bruce McLeod, M.D., Assistant Professor of Medicine, coordinates a program that provides white blood cells for these patients. It is a program that involves a great deal of time and highly complex machinery.

"If we could supply platelets and white cells reliably for everyone who is going to need chemotherapy, we could give much larger doses of chemotherapy," says Dr. McLeod. "At the present time, there is a likelihood that you will do them harm, because the chemotherapy wipes out the blood-forming cells, so the patient doesn't have enough platelets or white blood cells." Dr.

Microbiology laboratory

McLeod draws blood out of a donor's arm through a tube attached to a centrifuge, which then separates the blood into red cells, white cells, and plasma. The white cells and platelets are drawn off, and the red cells and plasma are recombined and pumped back into the donor. It takes four hours—three hours on the machine and another hour for the donor to be hooked up and unhooked from the machine—to draw off a sufficient number of white blood cells. It takes two hours for platelets.

"Almost all the donors are relatives, spouses, or very close friends. They have to be willing to take this much time and be physically able to do it two or three times a week if necessary," Dr. McLeod says.

"We're still at a very preliminary stage with this process. There are still many problems to iron out. Because of the amount of time involved, only two or three procedures can be done per day. It is also difficult to match people's white cells and platelets properly."

Research is underway to test a new drug that can be given to donors to make white and red cells separate more easily and which appears to be harmless to donors.

Solomon S. Adler, M.D., Chief of the Special Morphology Laboratory and Assistant Professor of Medicine, is collaborating with Dr. Knospe in studies of stem cells and the environment that supports the growth of these cells, since the environment influences their growth and may play a role in the cells' becoming cancerous. He is studying characteristics of the growth and maturation of leukemia cells in mice and the role of the spleen in leukemia. Dr. Adler has found that leukemic mice without spleens live twice as long as leukemic mice with spleens, and that 20 to 30 percent of the mice that had spleens removed and 1 million leukemic cells injected never got leukemia. He is also evaluating the immunologic relationship between normal stem cells and leukemic stem cells and the effect on the development of the disease in mice when their stem cells are treated with antibodies to normal and leukemic stem cells.

Major efforts in basic research into the nature of leukemia and other cancers are also a primary focus of the Department of Microbiology. Friedrich W. Deinhardt, M.D., Professor and Chairman, participates in the coordination of Rush's cancer research efforts in the basic sciences and is chairman of the task force on basic sciences for the Illinois Cancer Council.

One of the most important contributions to cancer research of the team of scientists in the Department of Microbiology has been analysis and comparison of the ways different viruses cause different kinds of cancers. In the past such basic cancer studies were done with mice, but it was necessary to develop experimental models more closely related to humans. In the early 1960s, after considerable study, Dr. Deinhardt came to the conclusion that marmosets, small South American monkeys, would be more suitable experimental animals for studying human cancers. The monkeys were available in large enough numbers so that research use would not endanger the species; they were small enough so that large numbers could be kept in a laboratory without taking up too much space, yet large enough for surgical studies; they bred well under laboratory conditions; and they were inexpensive.

Marmosets were purchased and set up in laboratories at the Medical Center, both to study leukemia and other tumors in these primates and to breed them for further studies. They have proven to be an invaluable animal model and are now being used in research laboratories all over the world. One example of their usefulness is in the study of the transmission of Epstein-Barr virus to these small monkeys. Epstein-Barr virus is a herpesvirus that causes infectious mononucleosis in man, but it has also been associated with Burkitt's lymphoma in Africa and with nasopharyngeal carcinoma among Asiatic populations. The investigators in Microbiology are studying Epstein-Barr virus because it is the first bona fide human virus associated with lymphoproliferative disease. By using different subspecies of marmosets and inoculating them with Epstein-Barr and similar viruses isolated from nonhuman primates, diseases like infectious mononucleosis, lymphoma, and leukemia have been produced.

"The subspecies of monkeys mimics the reactions of man, so we now have laboratory models with which we can work," Dr. Deinhardt says, "and it shows that there is a possibility of developing an anti-cancer vaccine."

As a member of a small group of scientists recently sent to the USSR by the National Cancer Institute, Dr. Deinhardt became interested in a lymphoma observed in baboons there. It was found that the baboons could transmit the virus to one another, and two viruses have now been isolated from baboons, one a C-type virus and the other a strain similar to Epstein-Barr virus.

In another wide-reaching collaboration among different laboratories, it has been found that most primates from Asia, Africa, and the "Old World" in general seem to carry a virus like the Epstein-Barr virus in man, whereas primates of the New World carry herpesviruses,

"If we could supply platelets and white cells reliably for everyone who is going to need chemotherapy, we could give much larger doses of chemotherapy."
—Bruce McLeod, M.D.

which are similar but not the same. It has been shown that the viruses from the Old World monkeys transform one kind of lymphocyte (B-cells) and the agents from New World monkeys transform another kind (T-cells). This finding widens the opportunities for expanded study of the pathogenesis of such tumors, their chemotherapy and immunotherapy, and their prevention by such means as vaccination.

The ability to cause cancerous changes in test tubes similar to the changes seen in the cells of experimental animals that produce leukemias and lymphomas has enabled the research team to develop specific cell lines—cancerous and noncancerous—that can be studied and compared with other cancerous cell lines grown in the laboratory. Based on this research, work is going ahead to decipher how viruses are carried by tumor cells during their life cycle, how tumor formation occurs, whether tumor growth appears, and whether viruses can be removed from these cells. Lawrence A. Falk, Ph.D., Assistant Professor of Microbiology, named a Leukemia Society of America Scholar last year, is conducting some of these studies this year at the Karolinska Institute in Sweden.

In addition, studies in the Department of Microbiology have shown that various C-type viruses can produce sarcomas, cancers of the connective tissues, in marmosets, and the first primate sarcoma virus was solated and characterized during hese studies, opening the way for more detailed investigations into yet another form of human cancers.

Since the 1940s, radiation therapy has been an important adjunct to surgery in some cancer treatment and a treatment in and of it-

Mice are used extensively in leukemia esearch.

Marking the radiation site

self for many other kinds of cancer.

The basic effect of radiation therapy is to destroy the ability of cells to divide and grow. The cell killing takes place in tumor cells and in normal tissue cells alike.

Treatment is always designed to maximize the injury to tumor tissue and to minimize injury to normal tissue. Therapeutic radiologists participate in treatment teams with surgeons, oncologists, and other physicians who plan treatment regimens. They also participate in developing protocols for treatment of various cancers as part of national study groups.

Dr. Frank R. Hendrickson says that his department is especially interested in studying how radiation therapy interacts with chemotherapy in cancer in order to learn how to use the two modalities more effectively.

Within the department, some remarkable programs have been instituted to minimize the possiblity of human error in the application of radiation therapy and to make it as precise as possible. The department was one of the world's first to develop a computerized system of treatment planning. A computer has been used for several years to help plan the amount of radiation dosage given to patients so that the most effective possible amount of dosage is delivered in the shortest amount of time. Built on this is the world's first program of treatment verification, which teams from South Africa, France, England, and other countries have visited the Medical Center to study. It works in the following way: At the first treatment session, the physician, radiotherapy technician, and a physicist are present to determine how much

Technician holds a baby marmoset, born in a special laboratory at the Medical Center.

The basic effect of radiation therapy is to destroy the ability of cells to divide and grow. The cell killing takes place in tumor cells and in normal tissue cells alike.

Radiation therapy is both an adjunct to surgery and a therapy in and of itself.

dosage the patient should receive and precisely where it should be beamed, so that the minimum amount of healthy tissue will be affected. All information about this first session is fed into a computer. In subsequent treatment sessions only the technician is present, but the computer has been programmed to verify his work. It can compare what the technician does with its information and let him know immediately if he is wrong. If the treatment plan is changed along the way, the technician can override the computer, or the program can be changed.

The department is also working on the development of a dynamic treatment plan. This would involve using the computer to control the treatment machine so that it can generate odd shapes of beams to fit more exactly odd shapes of tumors. At present, beams are shaped to fit square or flat tumors only. Since the new EMI scanners and other devices now make it possible to determine the exact shape of the tumor, the department is trying to devise treatments precisely suited to this information. Both the machine and the area on which the patient lies would be computer managed so that both the patient and the machine could be moved at the same time to control the dosage shape.

The department expects to acquire greatly expanded space when the new $5 million Rush Cancer Treatment Center is opened. This space will provide room for a Betatron Linear Accelerator, which would be the most powerful in the Metropolitan Chicago area. Betatrons emit electrons that operate like pellets, going directly to the tumor. They are especially useful in treating a tumor that is near a normal organ, because an x-ray might go through the normal organ as well as penetrating the tumor, while the electrons go directly to the site where they are beamed.

The department is also studying the optimum intervals between doses of therapy that would be most effective for the tumor and for healthy tissues, and cell generation times for tumors and normal tissue, to see how radiation upsets this. Finally, a study is underway on cost containment, to look at the most efficient, effective, logistically feasible method of reducing the cost of therapy to patients.

Hospitalized cancer patients are not segregated to any particular ward of the Medical Center. Thus most of the nursing staff care for cancer patients along with their other patients. Through a unique support system in the Nursing Division, all nurses have access at all times to specialists in cancer care who can advise them on how to meet the particular needs of cancer patients. Some of these specialists are graduates of the post-graduate program in Oncology Nursing in the College of Nursing.

"The emphasis in our program is not on death and dying, but on life and living," says Myra Levine, S.B., M.S.N., who directs this graduate program.

"Something like three-fifths of the people who were diagnosed five years ago as having cancer are still living. That's the population we have to deal with. If there are

Preparing an injection

enough nurses educated in the special problems of cancer patients, they can go forth and cause a ripple in the profession."

Rush faculty members are participating on a committee preparing a position paper on oncology nursing in Illinois with recommendations for practice, education, research, and professional relationships that will be submitted to the Illinois Cancer Council.

At present there are eight oncology nurses on the staff at the Medical Center, one in Pediatrics, four in the Medicine wards, and three on the surgical floors. They carry a patient load, but they also serve as consultants to the other nurses on their units who deal with cancer patients, and teach in the College of Nursing.

"Our scope is broader than taking care of one patient," says Susan Groenwald, R.N., M.S., Instructor of Nursing. "We're trying to teach others all the time—staff nurses, students, patients, families."

"Knowing that we are there to talk to often helps the staff nurses," adds Michelle Stonecipher, B.S.N., M.S., Instructor of Nursing.

The special nursing needs of cancer patients revolve around the side effects of chemotherapy and radiation therapy, teaching both patients and nurses what to expect and what to look for; the changes in lifestyle that cancer can bring; and the deformity that the removal of a tumor can cause. Nurses, for example, help patients who have had their colon or bladder removed look after their stoma, an opening in the abdomen to which a pouch is attached for body wastes. They teach arm exercises to patients who have had mastectomies, and try to make patients whose cancer has metastasized to the bone as comfortable as possible.

Dealing with the side effects of radiation therapy and powerful anticancer drugs are the difficult problems.

"My patients feel worse before they get better," says Phyllis Bermensolo, R.N., M.S. "We try to explain to them as closely as possible what to expect."

In addition to acting as a consultant to staff nurses on the units, the oncology nurses often have to teach members of the patient's family how to provide care to the cancer patient when he goes home.

The oncology nurse's patients are persons for whom they are the primary nurse and persons whose treatment they plan in conjunction with another primary nurse. The Rush Cancer Center publishes a daily bulletin of patients who have been admitted with cancer. The oncology nurses study this bulletin to see if any patients whom they have cared for in the past have been readmitted, and then immediately follow up on those patients.

"Recurrences are very difficult for us as well as for the patient," says Ms. Bermensolo. "After the trauma of surgery and the discomfort of chemotherapy or radiation therapy, you feel that the disease ought to have gone away, you feel it was all worth it if the disease has gone away. It's devastating for us all to find out several months later that the disease is still there."

The oncology nurses are also engaged in research projects. Ms. Groenwald, Ms. Stonecipher, and Margaret Hansen, R.N., M.S., are planning a breast cancer detection program for hospital inpatients, including routine checks, family histories, and other information, on a random sample of women who are admitted to the Medical Center. They will attempt to pinpoint risk factors. The group is also planning a research project to evaluate the effectiveness of their methods of teaching breast self-exams. Ms. Bermensolo has set up a slide-tape presentation for teaching leukemia patients and plans to assess the effectiveness of this presentation. Ms. Stonecipher and Ms. Hansen are currently writing guidelines for the nursing care of head and neck cancer patients for the Nation-

Myra Levine, S.B., M.S.N., director of oncology nursing, with students.

"Our scope is broader than taking care of one patient. We're trying to teach others all the time—staff nurses, students, patients, families."
—Susan Groenwald, R.N., M.S.

Susan Groenwald, R.N., M.S. (right), conducts a meeting of oncology nurses.

al Cancer Institute, Bethesda, Md.

Finally, the oncology nurses are especially interested in setting up a cancer clinic for out-patients, to be run by nurses. "Patients don't stay in the hospital long enough to be rehabilitated properly," says Ms. Stonecipher. "They are often sent home with tubes, dressings, colostomy bags, and they need to know how to use them properly. Such a clinic would enable us to reinforce what we teach them while they are in the hospital, offer an opportunity to give patients checkups, and help in the detection of recurrences. It would be especially useful in the network hospitals."

Colon and rectal cancers currently have a 50 percent cure rate but, according to Dr. Frederick dePeyster, the cure rate could be as high as 90 percent if more of these cancers were detected at the earliest, asymptomatic stage.

"If only we could establish the habit of proctoscopy during all routine physical exams, we could pick up the 'silent rectal lesions' instead of waiting for symptoms," he says. "This type of cancer has the best chance for an improved cure rate with early detection."

Dr. dePeyster and his colleagues are participating in national studies to assess the effects of adjuvant radiation therapy on the rate of recurrence and of the recurrence time and survival rate of patients treated surgically for cancer of the rectum. Studies are also underway to assess the effectiveness of adjuvant therapy following surgery. Recently a member of the nursing staff, Mildred Kemp, R.N., M.S., took a six-week course at the Cleveland Clinic on the special problems of caring for colostomy patients, patients who have had their colons removed (usually because of cancer). Ms. Kemp, who is also a member of the College of Nursing faculty, is teaching students and other members of the nursing staff how to care for these patients.

Rush has the largest gynecologic oncology service in the Chicago area. All patients with cancer of the ovaries, cervix, or endometrium are seen in a cooperative tumor clinic by three specialists: a gynecologic oncologist, a radiation therapist, and a medical oncologist. "We try to see all the patients as a team," says George D. Wilbanks, M.D., Chairman of the Department of Obstetrics and Gynecology, who specializes in gynecologic cancer patient management.

"We all talk to one another, and together we evaluate the patient and evaluate the possibility of different treatment modalities and combinations of modalities," he says.

"Then we try to tailor a treatment to the condition and stage of cancer of the individual patient." Dr. Wilbanks has found that patients with some early cancers can be treated on an out-patient basis, saving time, money, and physical and emotional stress to the patient.

The group participates in a nationwide cooperative study, involving some 30 institutions that treat gynecologic cancer patients, to evaluate the best methods of treatment.

Dr. Wilbanks is currently studying the relationship of herpesvirus to cancer of the cervix in Rush's gynecologic oncology laboratories. In studying herpesvirus in tissue culture, he has found that to date it has not caused cancerous changes in normal human adult cells. Thus there must be another agent along with the herpesvirus that causes cancerous change in the body. He is trying to find out what that other agent is.

Every hour, every day 10 people in the United States die of lung cancer, a cancer that in large measure could be prevented. It is the number one cancer killer this year.

"Lung cancer is a disease of

The operating room

modern man," says C. Frederick Kittle, M.D., Professor of Surgery. "It can properly be called the scourge of the 20th century. All evidence indicates that most carcinoma of the lung is due to some type of pollution, particularly cigarette smoking.

"The frustrating and devastating fact about lung cancer is its low cure rate," Dr. Kittle says. "Despite all scientific advances, the five-year survival rate today is the same as it was 20 years ago, about 5 percent. The reason for this abysmally low rate of survival is the biological tendency of lung cancer to spread early throughout the body—metastasis.

"Urban pollution and cigarette smoking have not only increased the frequency of lung cancer but they have also widened the age groups involved so that we see this cancer in all age groups, from patients in their 20s to patients in their 80s. The incidence in females is also increasing, correlating with their more frequent use of cigarettes."

The most obvious risk factor for lung cancer is smoking. Second is environmental pollution. Third is a history of lung cancer in the family, and fourth is a history of any cancer in the family.

For persons with these risk factors, Dr. Kittle suggests anticipatory medicine. A chest film should be taken every six months, so that the cancer can be detected early. With any radiologic abnormalities or unusual symptomatology, fiberoptic bronchoscopy should be performed. The latter, because of its simplicity and its diagnostic acumen, should be used more frequently. Of course, every effort to decrease pollution of the air the patient breathes is also important.

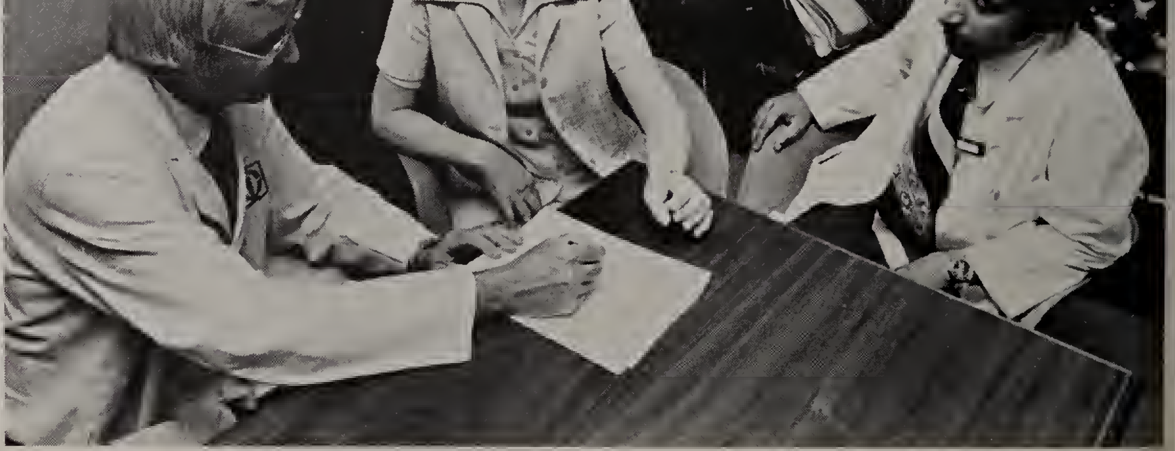
Robert J. Jensik, M.D., Professor of Surgery, is one of the nation's foremost proponents of a surgical technique for lung cancer called segmental resection. This procedure involves removing a portion of the lobe called a segment rather than the entire lobe. The patient then retains more lung tissue, which is of value if his breathing capacity is reduced as a result of associated emphysema. Furthermore, should a tumor develop in the opposite lung, it then can be treated by a similar procedure because of adequacy of pulmonary reserve. The survival rates are as good as for operations that remove larger amounts of lung tissue.

Just as a large proportion of lung cancer could be prevented if people stopped smoking, a large proportion of skin cancers could be prevented if people who spend time in the sun took specific precautions to block out its harmful ultraviolet rays. Between 90 and 95 percent of most common skin cancers occur on the areas of the skin that are exposed to sunlight, such as the face and the arms.

"The cult of sun-worship is a two-edged sword," says Frederick D. Malkinson, M.D., Professor and Chairman of the Department of Dermatology. As people have more leisure time and spend more of it in warm climates, the incidence of skin cancer is rising dramatically. In the past, most skin cancers were observed in patients in their 40s and 50s or older. Dr. Malkinson is now seeing such patients in their 30s and even their 20s.

"A person's vulnerability to skin cancer depends on many factors, such as the type of pigmentation they have and their daily activities. The blue-eyed blond who burns is the most vulnerable," he says.

The two most common kinds of skin cancer are basal cell carcinoma and squamous cell carcinoma. Both, fortunately, have a very high cure rate. Basal cell carcinoma almost never metastasizes. However, if left untreated it grows much larger and can be very destructive, eroding the bones and skin underneath it. It can be treated with radiation, by surgical removal, or by topical application of anti-cancer drugs. It



George D. Wilbanks, M.D. (left), with patient and radiologist.

> *"All evidence indicates that most carcinoma of the lung is due to some type of pollution, particularly cigarette smoking."*
> *—C. Frederick Kittle, M.D*

Technician examines cells.

almost never recurs. "The best treatment is prevention," says Dr. Malkinson, "wearing protective clothing and using preparations that block the ultraviolet rays of the sun during sunbathing." He also advocates having any unusual skin lesions treated immediately, particularly the scaly red lesions called solar keratosis that break out on the face, the back of the hands, and on bald scalps. In about 10 to 15 percent of the cases these are precancerous conditions.

While sunlight is the most significant factor in common skin cancers, a number of other causes have been identified, such as medications containing potassium arsenite solutions or inorganic arsenic and arsenic-based pesticides.

Melanoma is a particularly virulent skin cancer that does not have the generally favorable prognosis of basal cell or squamous cell carcinoma and for which there is less of a correlation with exposure to the sun. What makes melanoma such a terrifying disease is the fact that it usually metastasizes, even after the five-year disease-free period when most cancers are regarded as cured. New, more aggressive chemotherapy regimens following surgical excision of the tumor have greatly improved the life expectancy of melanoma patients, however.

With Roger Pearson, M.D., Professor of Dermatology, Dr. Malkinson is studying the effects of radiation and chemotherapeutic drugs on hair follicles. Hair follicles are one of the fastest protein factories in the body and have among the most rapid turnover of any cells. Thus hair is very susceptible to the infusion of drugs and radiation and is an excellent model for studying their effects.

Dr. Malkinson is well known for his discovery (with Dr. Melvin Griem of the University of Chicago) that if anti-cancer drugs are given prior to radiation the effects of radiation can be increased and tumors can be treated with less radiation, thereby posing less risk to healthy tissue. This principle has now been adopted in therapy for cancer patients.

Dr. Malkinson and Dr. Pearson are also studying the hair follicles of mice to determine the optimal time to give drugs after radiation and what combinations to give. In electron microscopy studies of hair follicles, Dr. Pearson has learned that although drugs do not affect connective tissue permanently, radiation can scar or burn it permanently. Since most tumors are not made of connective tissue but have connective tissue supports, this factor must be taken into account in evaluating the proper dosage of radiation.

While new treatments are greatly improving the life expectancy of patients with some cancers, other cancers are increasing with such frequency that the good news on one front seems to be offset by bad news on the other. Bladder cancer is one disease that seems to be increasing at a serious rate.

"We're seeing almost twice as many as we used to," says Malachi J. Flanagan, M.D., Professor of Urology. Dr. Flanagan coordinates Rush's participation in the National Bladder Cancer Program, a national cooperative study in which nine other leading institutions are also participating.

"We're trying to define a group of patients who will respond to a particular treatment in an effective way," says Dr. Flanagan. "We're also trying to develop a profile of the high-risk patient so that when that patient has an annual physical he

Finding the right sample

will be sure to have a cystoscopic examination."

There are two kinds of bladder cancer. One is a low-grade noninvasive tumor that presents no serious threat to life expectancy if it is kept under control. This type of tumor tends to recur but can be removed by cystoscopic surgery. However, about a fourth of the noninvasive tumors recur as invasive bladder cancer, and "Half of the patients who have invasive bladder cancer are dead within 30 months," says Dr. Flanagan. Working with Dr. Weinstein, Dr. Flanagan is studying changes in bladder tumor cells to see if there are any changes that precede invasiveness and make it possible to predict which tumors will become invasive. In January, he began testing two new drugs that have proven effective in Britain and Japan but that had not been tested yet in the United States. The Medical Center is the only institution in the Chicago area where these drugs are being tested.

A major problem with bladder cancer is that there must be frequent follow-up to monitor the course of the disease. Usually this follow-up every few months requires hospitalization and general anesthesia because the cystoscopic procedures involved are painful.

"It is expensive and uncomfortable. If there are no symptoms, the treatment seems more uncomfortable than the disease," says Dr. Flanagan. He has developed a procedure to perform this examination under local anesthesia in the operating room, with immediate pathologic evaluation. The patient is able to go home after two hours. Because of this change, many more patients are reporting for follow-up than in the past.

Dr. Flanagan considers males aged 30 to 50 who smoke and have recurrent irritable bladder symptoms, even without blood in the urine, as potential bladder cancer patients and examines them as such. Smoking, exposure to analine dyes, and to materials in the rubber industry are among the external environmental factors that have been associated with bladder cancer.

Lack of symptoms is one of the most serious problems in attempting to identify cancers. Cancer of the prostate is a perfect example. Less than 5 percent of the men who have this condition can qualify for total cure. "The problem is that in the other 95 percent the cancer has already spread beyond the prostate by the time there are symptoms and we get to diagnose them," says Charles McKiel, M.D., Chairman of the Department of Urology. "That's why we constantly ask for rectal exams at all annual physicals. Even in those cases where the cancer has spread we can get a 60 percent five-year survival rate. But we would do much better if we could catch it earlier."

Surgeons have been using cryosurgery, a technique of destroying tissue by application of extreme cold, to excise prostate tumors. The results have been excellent, particularly in very elderly men, since there is no blood loss. For unexplained reasons there also has been prompt relief of bone pain and some metastases have regressed. "Even though cryosurgery has shown great promise, it is still in the experimental stage," Dr. McKiel says. "We still need to work out better ways of controlling the freezing."

Dr. McKiel says that survival rates are going up dramatically in testicular cancer, which 20 years ago was considered hopeless and which is still the cancer that causes the most deaths among men in the 20 to 40 year old age group. A surgical technique for this cancer pioneered by Dr. McKiel is now being used widely. In removing the lymph nodes, which drain around the test-

Ronald Weinstein, M.D., uses the electron microscope.

Males aged 30 to 50 who smoke and have recurrent irritable bladder symptoms, even without blood in the urine, are potential bladder cancer patients.

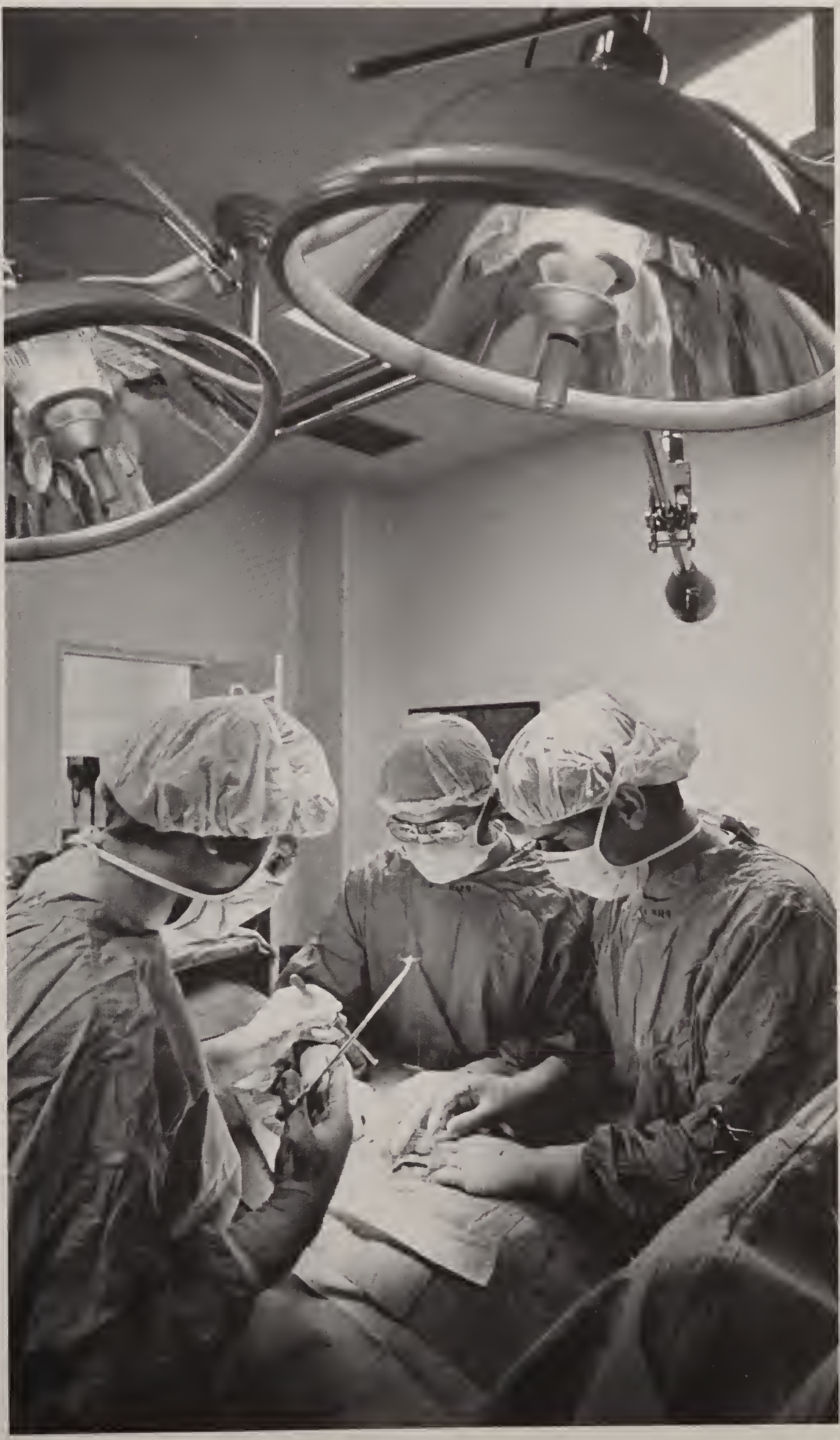
icles, it had been standard practice to approach the area through the abdomen. Dr. McKiel's approach is to go through the back, using a technique common in kidney surgery. This does not cause any abdominal problems, affords a better view, and is generally safer. He has performed this procedure on 75 patients with excellent results.

Some preventive measures can be taken with testicular cancer, Dr. McKiel says, because this type of cancer is especially common among men who had undescended testicles as children. If the testicle is left undescended, the chances of its becoming cancerous increase fortyfold. If brought down, the cancer risk is reduced by half.

"Our general rule is that if a testicle is undescended by the age of 10, it should be removed. Between the ages of six and 10, it should be brought down and biopsied. If it is damaged, it should be removed."

Dr. McKiel also treats kidney tumors, for which the prognosis is usually favorable. As a rule, kidney tumors are treated by removing the entire affected kidney. However, as life expectancy increases, tumors often occur in the other kidney. "We now do partial removal of the kidney in selected patients. This way even if the patient later develops cancer in the second kidney, he will have a portion of each kidney left."

Pain is a serious by-product of cancer. Most cancer specialists agree that pain is not the result of primary tumors but of metastasis. Breast cancer, prostate cancer, bladder cancer, and other cancers often metastasize to the bone or nerve ends. Implants in ovarian cancer can cause painful bowel obstructions. There are a number of options for relief of pain, both through neurosurgery procedures



Surgery is a primary therapy for cancer.

Immunology laboratory

and through the Rush Pain Center.

According to Walter W. Whisler, M.D., Chairman of the Department of Neurosurgery, and Charles M. D'Angelo, M.D., Assistant Professor of Neurosurgery, cordotomy is one of the most frequently used neurosurgical procedures for the relief of pain.

"The spinal cord is like a giant coaxial cable carrying fiber tracts to and from the brain," explains Dr. Whisler. "We determine the site of the pain and electrically stop the fiber cords that are carrying pain to this site. The patient is awake, and we place electrodes on the skin. Ninety-nine percent of the cordotomies we do are on cancer patients, mostly patients with metastasis from the breast, lung, or prostate."

Another procedure is rhizotomy, where a specific nerve root next to the spinal cord is cut to knock off nerves to the chest or abdomen. Ninety percent of these patients have cancer. Finally, there is stereotactic mesencephalotomy, used almost exclusively on cancer patients, particularly patients with cancer of the jaw or face that has spread and is eating through the skull. With the patient awake under local anesthesia, a hole is made in the skull, and electrodes are placed in an appropriate part of the brain stem to cause an interruption in the pain fiber tract.

Some pain patients are treated by their oncologist. Others are referred to Neurosurgery, and others are referred to the Rush Pain Center. Max Sadove, M.D., Chairman of the Department of Anesthesiology and Director of the Pain Center, says that the center is "oriented toward helping the patient diminish suffering, sorrow, or pain. We try to keep up hope and a good mental attitude, in addition to alleviating pain."

Dr. Sadove usually meets with Dr. D'Angelo and Philip S. Epstein, M.D., Assistant Professor of Psychiatry, to evaluate each pain patient. If neurosurgery is not indicated and the problem is not psychiatric, he tries to block the nerves that are the site of the pain with phenolcarbolic acid or alcohol. He is totally opposed to giving narcotics to chronic pain patients because of the problem of addiction. "We're always looking for nonaddicting analgesics," he says. "That's our great hope."

Neurosurgeons also treat tumors of the brain and nervous system and are conducting research on several cancer problems. The department is participating in a national study of brain cancer treatment to test experimental drugs.

Neurosurgery is performed both to excise tumors and to refine or establish diagnoses, such as to establish whether a spot on an x-ray film is a tumor or a blood clot. Primary brain tumors are rare. However, metastatic tumors of the brain and spinal cord from lung cancer or breast cancer are common. Transpenoidal hypophysectomy is a common procedure used to stem the growth of metastatic tumors. With the aid of a high-powered microscope, the neurosurgeons make an incision inside the nose to remove part of the pituitary glands, which contain growth hormones. This, for a time, stops tumor growth and even causes the tumor to shrink. As the tumor shrinks, the bone pain disappears. If there is metastasis to the spine, the neurosurgeons can remove a vertebra or parts of vertebrae and make new ones. They can also do a laminectomy, removing the bone covering the back part of the spinal cord if the tumor is in the back.

A treatment to relieve blockage by metastatic breast or lung tumor cells that get into the spinal fluid is the Omaya Reservoir. A catheter is placed within the ventricles of the brain, and chemotherapeutic agents are injected into the reservoir to kill the tumor. This is more effective than conventional chemotherapy, which often does not reach the brain. The injected chemother-

Harry W. Southwick, M.D., performs neck surgery on cancer patient.

"We believe there is an association between an ability to make an immune response and a malignancy."
—Henry Gewurz, M.D.

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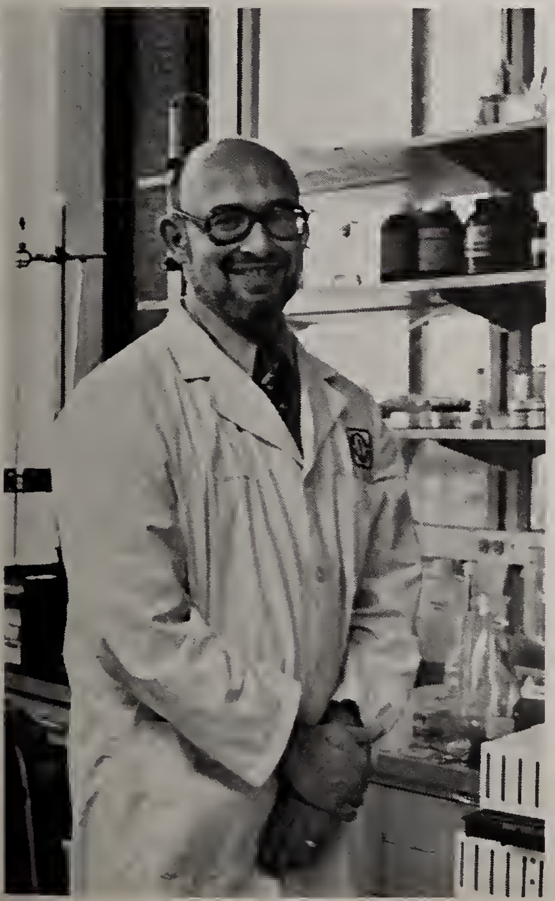
apy diffuses through the system, relieves blockage and headache, and slows the tumor down. This results in a slight prolongation of life as well as in a great improvement in the quality of life, relieving pain, double vision, and other problems caused by the tumor.

Several other research projects are also underway. Investigators in the Department of Microbiology, working with neurosurgeons, are developing a model system to study brain tumors caused by viruses in marmosets. Analyses of the spinal fluid of brain tumor patients are being made in the hope of noting changes in the fluid on the basis of which tests can be developed to identify these patients early. Richard D. Penn, M.D., Assistant Professor of Neurosurgery, is using computed tomography to measure the growth rate and vascularity of brain tumors.

The focus of the Department of Pharmacology is the study of how anti-cancer drugs metabolize in the blood to determine the optimum dosage and to understand how these agents work.


Henry Gewurz, M.D.

Paul E. Carson, M.D., Chairman of the Department, and his associates, specialize in the relatively young field of clinical pharmacology, collaborating with physicians at the bedside to learn how drugs work. As part of a national study group, he is evaluating the effectiveness of intravenous infusions of methotrexate, a common anti-cancer drug, in hospitalized patients with sarcoma, a relatively rare bone cancer. Usually, methotrexate is given orally or by injection. It has been found that it is possible to give much higher, and therefore more potent, levels of the drug intravenously.

Evaluating how a drug works in a patient is a highly complex process that must take into account genetic factors, the constitution of the patient, drug metabolism, and the stage of the tumor. Dr. Carson is hoping to develop a "repertoire" of drugs, measuring all the commonly used drugs to see how they work in different patients. Ultimately, he hopes to be able to predict how a specific drug will work in an individual patient. Such information will be enormously helpful to clinicians attempting to decide on the type and dosage of a drug to give a cancer patient.

One of the most important problems in cancer is how the body's immune system responds to a tumor. Tumor cells are immunologically different, and patients who have been given immunosuppressant drugs so that they will not reject transplants seem to have a higher incidence of tumors. At Rush, an immunologic profile of all cancer patients now is being developed, coordinated by the Department of Immunology.

"Some people feel that the immune response is not important," says Henry Gewurz, M.D., Chairman of the Department of Immunology, one of only two full departments of Immunology in the nation.

"We believe that there is an association between an inability to make an immune response and a malignancy. We have a number of parameters for studying this. For example, skin tests. We take a group of antigens that most people have been exposed to and put them on the skin to see if there is an appropriate reaction—for example, tuberculin or mumps skin tests. If the patient doesn't react, the indication is that there is something wrong with the immune system." Other tests measure the levels of antibodies, study the presence of naturally occuring antibodies, study the rate of blood sediment action, and study counts of certain types of cells. The object of the Immune Surveillance Profile is to get a profile of the condition of the patient's immune system and watch how it develops and how it changes through therapy. The program, which began in January, is a service to all the cancer programs in the Medical Center and is part of a national effort to see if these parameters are valid, and to assess the impact of anti-cancer treatment on the immune system.

Cancer is never more tragic than when it affects children. Mila Ione Pierce, M.D., a pediatric hematologist, has been treating childhood tumors since 1935.

"Treating any child with cancer is a long-range project," says Dr. Pierce. "First the initial shock of the family has to be worked through. Every discipline that is involved should be introduced at this time, including the pediatric surgeon, the oncologist, the nurse oncologist, and so on. We try to set

Equipment aids in diagnosis

Left to right: Padma Balasubramanian, M.D., and Mila I. Pierce, M.D., with leukemia patient.

up a program that causes as little trauma to the child as possible."

For the past 20 years, Dr. Pierce has been working with the Children's Cancer Group A, a group of pediatric oncologists in the major medical centers of the nation, who work together to develop protocols for treating childhood cancers. When the group started working together in the late 1950s, chemotherapy for leukemia was just beginning. A very small number of leukemia patients lived longer than a year. Five-year survival was under 10 percent. Since 1970, there has been a much more aggressive approach to therapy of childhood leukemias. In addition to larger doses of chemotherapeutic agents, young leukemia patients also receive radiation therapy to the spine and skull, to prevent leukemic involvement of the central nervous system. Today, at least 50 percent of the first remissions (disease-free states) last as long as three years, and the projected five-year survival rate is 50 percent.

Wilm's Tumor of the kidney is a curable cancer of children. If the tumor is localized, it is surgically removed. Radiation therapy is not used in infants because it might retard the growth of the spine. Even if the tumor extends beyond the kidney, it can be cured by chemotherapy. The cure rate is better than 70 percent, although this is reduced somewhat if the tumor metastasizes to the lung.

The prognosis for neuroblastoma, a cancer of the sympathetic nervous system, is, however, very poor. Children may be born with

> *"We are very honest. Most of our children know they have cancer and that cancer may be fatal, but also that the cancer may be arrested or cured. . . ."*
> *—Mila Pierce, M.D.*

this cancer. Often it is in the adrenal glands. It is usually large before it is found and by that time may have spread into the blood, bone, and bone marrow, causing considerable pain and discomfort. It is very resistant to drug therapy. Dr. Pierce says that an intensive, nationwide effort is now underway to develop new anti-cancer drugs that will improve the results in treatment of neuroblastoma.

In dealing with children who have cancer, health professionals have found that honesty is the best policy.

"We are very honest. Most of our children know they have cancer and that cancer may be fatal, but also that the cancer may be arrested or cured, with treatment," says Dr. Pierce. "They are told this at a time when they are feeling well and in remission. They see other children with other kinds of cancer who are also under treatment when they come to the outpatient office, and, seeing that they, too, are well, gain reassurance. The worst problem is their friends. School-age children can be unkind, and, not infrequently, they taunt the child, telling him he's going to die to demonstrate their own superiority."

Emotional support for cancer patients is critical. The Department of Pediatrics has a staff of four psychologists who help provide support. "Cancer doesn't always mean dying. It's also living," says Cecilia Brocken, Ph.D., Director of the Pediatric Psychology Program. "You have to cope with that, too. There are such things as losing your hair and having to go to school like that. As much as possible, you encourage kids to be in school and stay in school." Role playing is often used with the children. Dr. Brocken acts out reactions and questions they might get in school, so they can develop appropriate responses to them. But mostly what Dr. Brocken does is listen, and give the children and the families an opportunity to express their feelings.

"You get attached to the children. When they die, it's a personal loss for you, too," Dr. Brocken says. "It's very routine for doctors, nurses and psychologists who work with children to go to the wakes, send notes, cards, and invite the family back."

"You grieve with them and for them," says Gary R. Strokosch, M.D., Assistant Professor of Pediatrics and Director of the Adolescent Unit. Dr. Strokosch also emphasizes the importance of working with the families of young cancer victims.

"A lot of things happen in a family when a child gets cancer. Parents become overprotective of the other children and worry about whether the disease runs in the family. They develop inappropriate notions of how to protect the other children in the family from the disease."

During the period of treatment, Dr. Strokosch tries to work with the family as much as possible. If the patient dies, he contacts the family afterwards "to see how things are going, and to give them a chance to talk it out."

One focus of research in the field of eye tumors has centered on finding ways of treating retinoblastoma, a rare hereditary tumor of the retina in children, and malignant melanomas of the charoid in adults without removing the eye. Working with Dr. Hendrickson, William F. Hughes, M.D., Acting Chairman of the Department of Ophthalmology, has developed a method of local irradiation as an alternative to surgical treatment of small melanomas. This is done either by implanting radon needles surgically over the tumor in the sclera, or by placing a radioactive iridium wire suture on the sclera. The results have been successful, with patients surviving tumor-free or with the tumor arrested and with vision remaining unimpaired. Retinal blastoma is us-

Cecilia Brocken, Ph.D., director of pediatric psychology, counsels two young cancer patients.

Patients can evaluate their care

ually evident before the child reaches the age of two years. If it appears in both eyes, the worse of the two eyes is removed and the tumor in the other eye is treated with radiation, laser photo coagulation, or both. The prognosis depends primarily on the size and type of the tumor and on the stage it is in when found.

Primary bone cancers are rare forms of cancer, but metastasis to the bone is frequent after breast, lung, cervix, and other common cancers.

The standard therapy for primary bone and cartilege tumors is amputation of the affected limb followed by multi-agent chemotherapy. A new prosthetic device developed by Jorge O. Galante, M.D., Chairman of the Department of Orthopedic Surgery, may make it possible to avoid amputation of some bone and cartilege tumors. The device was implanted in baboons and now has been tried on a number of human patients with good results.

The prosthesis is made of a meshed titanium material. It has been found that bone grows very quickly in and around such material. Whole segments of cancerous bones are removed and the prosthesis is inserted. New bone begins to grow in and around the prosthesis, and amputation is avoided.

In the case of metastatic bone cancer, orthopedic surgeons attempt to strengthen the bone to prevent fractures that would further incapacitate patients. They insert pins, screws, and intermedullary nails to strengthen the bone. Current basic research in the department is focusing on inhibitors in cartilege that prevent cancer and on evaluating whether or not these inhibitors could be used to prevent cancer in other parts of the body.

Living with cancer brings not only physical and emotional stress, but also financial hardship. "Many families of cancer victims have enormous financial problems," says Flora Balanag, M.S.W., Director of the Social Services Department.

"Private insurance plans are limited," she explains. "Many pay only 80 percent of the bills. That sounds pretty good in theory, but over a long period of treatment the 20 percent the patient has to pay can add up to an enormous amount of money, particularly if he is not earning while he is spending."

Ms. Balanag and her staff help patients in need apply for public aid, social security, job benefits, and other types of financial assistance available to them. But it can be a painful process.

"It's very hard for people who have been steady workers all their lives to deal with the need for financial assistance," she says. "We must make sure that the patient is able to maintain his dignity and pride while asking for help."

There are many community resources, and the Social Service Department can help the cancer patient and his family make appropriate use of them. Services may range from help in obtaining wheelchairs and other appliances to arranging for homemakers or other home care services.

The focus of social work activity is to keep the family intact and enable its members to live as normal a life as possible under the circumstances. Cancer patients face formidable obstacles in doing this—changes in the usual family roles may be necessary; employers may be reluctant to hire someone with a history of cancer; adjustment to mutilating surgery is difficult. Social Service interviews are geared toward evaluating the home situation and assessing the ability and willingness of the patient and other family members to cope with the stresses and changes brought about by chronic illness. Efforts are directed toward reinforcing strengths and supplying support during periods of crisis. The importance of preserving hope is always kept in mind.

Raymond N. Miller, M.D., was the psychiatric consultant in the planning of the Rush Cancer Center, and he has participated in a number of national symposia on the emotional problems of cancer patients.

He is called in to help cancer patients when they are going through an emotional reaction to their awareness of the disease or to their awareness of dying and when the patient's emotional problems make him difficult for the nursing staff to handle.

"The major fears, after patients get over their fear of dying, are the fear of loss of financial support, fear of their families' and society's reaction to their illness, and fear of being an invalid. The more drastically the disease affects their lifestyle, the stronger the emotional reaction will be. As long as it doesn't change what they normally do, they can use denial. Once it interferes with their lifestyle, they can have strong reactions."

The most common reactions, says Dr. Miller, are depression and pain, and changes in behavior in relation to social, work, and sexual activities. Another problem faced by the psychiatrist is helping a spouse to understand the nature of the patient's illness and then helping the spouse to realize either that the patient will not die or how to cope with the prospect of death if it is a terminal case.

"You can't approach a cancer patient the way you approach a regular psychiatric patient," says Dr. Miller. "You have to have a good

> *"Sometimes our job is to convince a patient that he is not going to die, that his cancer has been arrested. . . cancer and death are not to be equated."*
> *—Rev. Bernard Pennington, M.Div.*

understanding of both physical and emotional illness. You have to understand how patients' physical problems affect their emotional well-being.

"Most of the patients are very happy just to have someone to talk to," he says. "The dying patients go through a mourning reaction when they become aware of their imminent death. It's important to help them understand their behavior."

"At catastrophic moments, people go back to basic faith. Spiritual life and prayer become very important and ultimate values become the center of focus," says Rev. Bernard Pennington, M. Div., Director of Clinical Pastoral Services in the Department of Religion and Medicine.

"We have had a strong pastoral care program here for all patients since 1968, and several of our staff specialize in working with cancer patients. Our chaplains get very humanly involved with patients. We try not to be detached. We want to be personally involved. But we bring an overt ministry only when it is appropriate. We take the patient at his invitation and on his own terms.

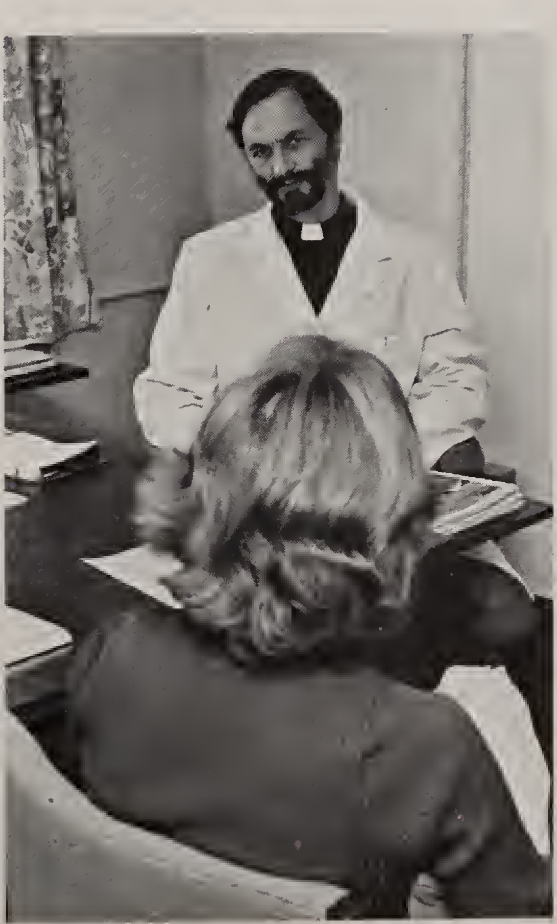
"While the problems of dying patients are of great concern to the six permanent staff members and four pastoral residents, sometimes our job is to convince a patient that he is not going to die, that his cancer has truly been arrested and that he is going to live; cancer and death are not to be equated. We're also quick to get with the families of cancer patients, since they are often frightened, and they are as much patients to us as the patient himself.

"The pastoral care staff is on call 24 hours, and is prepared to give patients as much time as they need. We're on the patient's time schedule. His or her personal adjustment to illness is our primary task, and to listen to the patient in his moments of pain and stress is of foremost importance in the process of healing."

"Giving personal time and sustenance," as Rev. Pennington calls it, is emotionally fatiguing for the chaplains.

"We also have to take care of our caretakers," he says. "We help them overcome the pain of what they have to experience. They can come back to our office and cry if they have to."

The pastoral care group has been involved in a number of programs to aid cancer patients. In 1971, the American Cancer Society provided the department with a grant for the establishment of a cancer care fellowship. The holder of the Fellowship and Rev. Pennington worked with Dr. Taylor in his office and accompanied him on hospital rounds. When funds ran out, the program was discontinued. Recently, however, through a fund-raising campaign organized by the widow of a patient, a small sum has been obtained for a fellowship and it will be reinstituted.



Rev. Bernard Pennington, M.Div.

Rev. Pennington was also instrumental in helping establish the American Cancer Society's Cancer Call-PAC with Georgia Photopolous, the founder of Call-PAC. He and Mrs. Photopolous met when they were both visiting a young woman attorney who was dying of cancer.

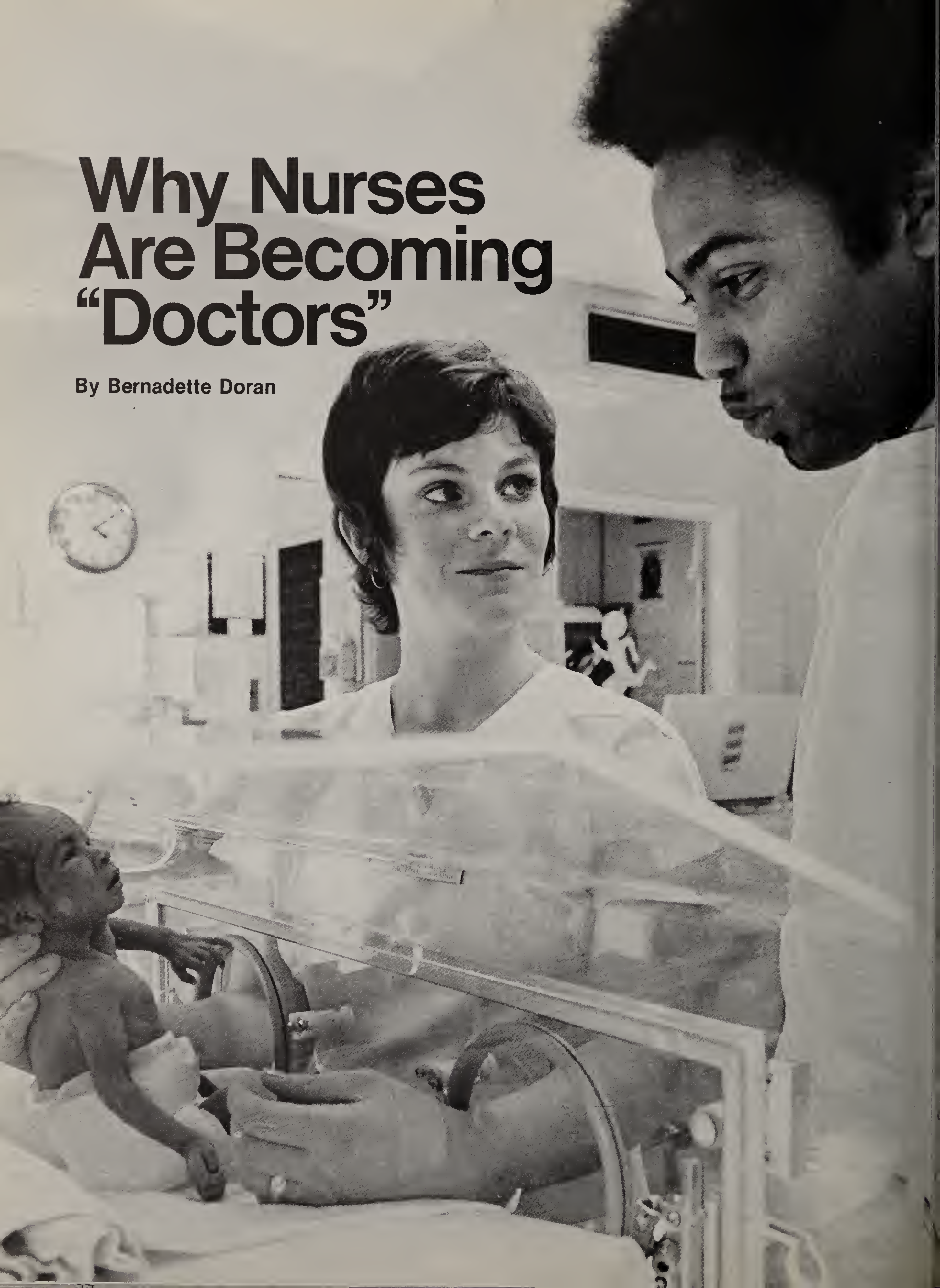
Cancer Call-PAC is a 24-hour service whereby patients or family members can speak with a volunteer, clergyman, or other interested person and discuss their feelings, fears, or concerns about their own case or the illness of a loved one.

The kind of pastoral counselor who works with cancer patients must be especially mature and sure of himself or herself as well as being professionally sensitive to human suffering, Rev. Pennington says.

At Rush-Presbyterian-St. Luke's Medical Center every aspect of cancer is attacked—the symptoms, the underlying biology, the effects. The multidisciplinary, multifaceted effort at this medical center is one important part of the enormous national effort to attack the cancer diseases. Each year, new discoveries signal new hope that the work being done at Rush and at other major medical centers like it will result in cancer being eradicated. Until that goal is reached, the all-consuming effort goes on.

Why Nurses Are Becoming "Doctors"

By Bernadette Doran



As systems for patient care become more sophisticated and demanding, the requirements for professionals who deliver the systems become more exacting. For health care professionals in general, it means the best educational and clinical preparation possible; for nurses in particular, it means preparation enhanced by doctoral-level education.

To meet the changing needs of the nursing profession, Rush College of Nursing, with the help of a $300,000 Bush Foundation grant, is developing a doctoral program for nurses to begin in the fall of 1977. It is the next logical step for the College, which currently offers programs leading to the Bachelor of Science and Master of Science degrees, both with a major in nursing, and post-master's study in geriatric nursing.

Although the progression is logical for the College, the concept of doctoral education is still embryonic in the nursing profession. "Nursing is what one might call a late bloomer. It's been around for a long time, but it stayed in an adolescent stage of training," says Luther P. Christman, R.N., Ph.D., Vice President, Nursing Affairs, and Dean, College of Nursing.

For much of its existence, the nursing profession groomed students and practitioners in the same place—the hospital—until training moved slowly to the academic community. Even today, a baccalaureate degree is not essential for entry into the field, which can be gained through licensure or an associate of arts degree; and, of the million and one-half men and women who are nurses, only 1,200 have doctoral level education.

But the evolution toward better education is beginning, precipitated by both the knowledge explosion that began in the 1950s and the demand for better training by more sophisticated health care systems that require it. As nurses found themselves in more responsible and more accountable roles, the need for advanced education became obvious.

"We're talking about nurses having intellectual and training status equivalent to other advanced scientists and practitioners," says Dr. Christman. "If nurses are going to be professional, they have to have professional education. No other profession declares itself a profession and gets accepted with less than university training."

The changing role of the nurse is typified by professional demands at Rush-Presbyterian-St. Luke's. "At the medical center, nurses have a fourfold professional role: to teach, to practice, to do research, and to manage. They cannot be purists," says Yvonne Munn, R.N., Ph.D., Assistant Vice President, Nursing Affairs, and Associate Dean, College of Nursing and College of Health Sciences. "If a nurse doesn't combine research with practice, she can't implement delivery systems, and doctorally prepared nurses can bridge the gap between research and practice."

Indeed, the doctorally prepared nurse finds that a variety of options are available. According to a report soon to be released by the U.S. Department of Health, Education and Welfare, 15,000 unfilled positions require nurses with doctorates—positions ranging from appointments to the faculty of university nursing programs to clinical practice.

"Doctorally prepared nurses are needed to function not in one arena but in all," says Lucille Davis, R.N., Ph.D., coordinator, Graduate Clinical Specialist Program, Geriatric-Gerontological Nursing. "Doctoral-level education provides research skills. To be able to investigate issues that are relevant to clinical nursing—in fact, to be able to raise the right kind of clinical questions in the first place—the nurse needs research skills as well as a clinical base."

Even if the nurse chooses not to be directly involved with doing her own research, she can effect its implementation. "There are doctorally prepared nurses," says Anne Neeley, R.N., Ph.D., chairperson, Obstetrics and Gynecological Nursing, "who are not in research positions but in department head positions that require clinical practice, teaching, and administration. That affords them a beautiful opportunity to implement clinically what is done in research."

Others agree that clinical management is a more necessary role for doctorally prepared nurses, particularly while their numbers remain small. "If nurses with doctorates flock to clinical practice, I think a large number won't know what to do with themselves and institutions won't know what to do with them. What does a D.N. do as a staff nurse?" says Sue Hegyvary, R.N., Ph.D., chairperson, Medical Nursing; director, Clinical Research Center for Nursing; associate professor, College of Nursing, and assistant professor, College of Health Sciences. "Other roles are easier to carve out. In the immediate future, it will be more likely that a doctorally prepared nurse will be in the primary care setting as an individual practitioner or in a managerial position, such as department head, keeping contact with and control over the day-to-day operations of clinical nursing practice. That provides the opportunity for both direct clinical involvement and direct research involvement."

Sue Hegyvary, R.N., Ph.D., and Luther Christman, R.N., Ph.D.

Some areas of patient care in both the hospital and community setting need to be more adequately addressed where the doctorally prepared nurse could be instrumental. Management of a population for which no physician is available is one such area, according to Dr. Christman. "Under a grant from the Regional Medicine Program one summer, nurses managed a vacation population in Kentucky," he says. "The gamut of primary encounters was taken care of, and the population was provided with care it never had before." In the hospital setting there are other roles that do not require graduate medical education, such as patient teaching in management of chronic illness, according to Dr. Hegyvary.

But the wide range of options for the doctorally prepared nurse raises a question. What should be the major thrust of the doctoral program for nurses and, therefore, what degree should be granted? Which would be more viable for nurses: the Ph.D., which has the reputation of being a research degree, or the D.N. or D.N.S., which denotes—like the M.D. or the D.D.S.—the highest level of professional training, but which is a fairly new and unknown degree?

In a symposium called "Should Nurses Be 'Doctors' " held recently by the Medical Center, speaker Helen K. Grace, R.N., Ph.D., College of Nursing, University of Illinois, reported the findings of a 1973 survey illuminating the differences among the nine schools then offering a doctoral program in nursing. Four offered the Ph.D., three the D.N.S., one the Ed.D., and one the D.N.

"The Ph.D. is typically a research degree and I don't see the appropriateness of preparing nurses with doctorates just as researchers," says Dr. Hegyvary. "But as far as what's appropriate for nursing in general, it's hard to say. I'm leery about the D.N., because it creates another degree that does not yet have legitimacy in the academic community, particularly with nursing not having had a true professional status to this point.

"The D.N. is a clinical, professional doctorate, the highest level of preparation in a professional area, comparable to the M.D. or the J.D.," she explains. "Even though the J.D. is a relatively recent degree, the field of law, like the field of medicine, has a longstanding professional reputation; because of the professional and social status of those two fields, their degrees never would be questioned. But a D.N. would not have the same kind of legitimacy."

In agreement about the difference in recognition and status among degrees, Dr. Davis says, "The D.N. as a professional degree doesn't have the track record of the Ph.D. Until we get to the point of having that critical mass of nurses with a professional degree who can demonstrate they have the knowledge and skills appropriate to the roles they are carrying out, the D.N. will remain an unknown quantity."

For these reasons, many nurses with doctoral training have pursued a Ph.D. in a related science field instead of the D.N. But they have found that the degree can detract from, rather than enhance, their professional status as a nurse. "Because my Ph.D. is in sociology," explains Dr. Davis, "people will say, 'You're a sociologist, not a nurse.' On the other hand, an M.D. can get a Ph.D. in sociology but no one would think him less of a physician."

Despite its relative newness, the D.N. could resolve such dilemmas, according to Dr. Christman. "Other scientists and practitioners—physicians, dentists, architects, and engineers—all have their own professional degree," he says. "I believe it's time that nurses accepted a professional degree as having more merit than a Ph.D."

In addition, the D.N. would more clearly define the professional orientation of the doctorally prepared nurse. "We can use the field of engineering for comparison," explains Dr. Christman, "which has both Ph.D. engineers and Doctors of Engineering. Ph.D.s are concerned with theoretical problems; Doctors of Engineering are concerned with real-world problems.

"For professional practice, the professional degree—certification of clinical competence at the doctoral level—is preferable," he adds. "The D.N. indicates very advanced professional training, not just advanced research training."

Even with a degree in hand, the nurse may find that the new image of the profession could take some getting used to. "We've seen a lot of changes already in the image of the nurse from someone who just follows the doctor's orders to a professional who can make decisions and judgments about care," says Dr. Davis. "Nurses are being expected to function in a collaborative way. The nurse is neither a completely dependent nor a completely independent practitioner; she must function interdependently, as do all other health care professionals."

An understanding of a new image largely depends on the nurse, according to Dr. Christman. "There has to be a change in the nurse's attitude," he says. "Health professionals have a certain amount of shared competence and shared power, which means better patient care delivery. Service must be intellectual and scientific as well as humanistic to be valuable to the public it serves. Nurses can't retreat into a historic posture."

The success of collaborative health care for better patient care also depends a great deal upon the institution, and the Medical Center is prototypical in this way. "The quality of practice starts with the way an institution operates," explains Dr. Hegyvary. "If a master's or doctorally prepared clinical specialist goes into a rigidly organized institution that has old-fashioned ideas about what a nurse ought or ought not to do, innovations won't be supported by people in management positions. Here at the Medical Center, we've approached it through organizational structure, beginning with support at the presidential and vice-presidential levels. The entire college and nursing service have been established jointly to enable combined roles, and this management structure facilitates change in the quality of care."

Models are currently in operation to develop interdependent health care teams, including the National Joint Practice Committee of Nurses and Physicians and the National Interstate Joint Practice Commission. "There are going to be hospitalwide joint practice committees as well to make their combined roles more useful to patients," says Dr. Christman.

"The demand systems of patients should be the main basis for the construction of models of care. In this manner, the strategy of cooperation can be given clear ground rules. Participation by partnership could replace negotiation by task," wrote Dr. Christman in "Education of the Health Team," published in the July 13, 1970, issue of the *Journal of the American Medical Association*. "Care is multidimensional in many of its elements. Each discipline represents one portion of the skills necessary to carry the patients through the period of diagnosis, treatment, and rehabilitation. What is necessary are organizational mechanisms that can encourage the innovative use of the total accumulation of all the skills. Shared-power models, with inputs and responsibilities based on individual competence, offer one way to accomplish this purpose. Workers will be more committed and innovative when they experience the professional excitement that comes from this type of collaboration in care, because it will stimulate their own growth and add to their usefulness to patients."

Bernadette Doran is an editor and free-lance writer.

Rush University Dedication

A descendant of Benjamin Rush, an internationally renowned educator and public servant, a Mayor who called himself "living testimony" to our excellent patient care, a Lieutenant Governor whose four children were born at the Medical Center, and some 1,300 trustees, leaders in the health professions, educators, alumni, benefactors, and friends, took part in the September 14 dedication of the Academic Facility of Rush University of Rush-Presbyterian-St. Luke's Medical Center.

"The objective of great patient care cannot be achieved without a full involvement in all aspects of higher education and inquiry," said Edward McCormick Blair, Chairman of the Medical Center. "It is that spirit that guides Rush University. It is that spirit we ask you to help us keep alive in the years ahead."

James A. Campbell, M.D., President of Rush-Presbyterian-St. Luke's, presided at the ceremony and declared the $24,500,000 building formally dedicated "to the Glory of God and the service of mankind," the motto of the Medical Center.

The "open air" ceremony was held at ground level under the new building, whose first floor actually begins at the fourth level. There, it bridges the Chicago Transit Authority elevated tracks and is linked to other Medical Center buildings.

Major dedicatory addresses were given by McGeorge Bundy, President of the Ford Foundation, and Alexander Rush, M.D., Medical Director of the Benjamin Franklin Clinic, Philadelphia. (See articles by Mr. Rush and Mr. Bundy on pages 42 and 44). Dr. Rush is a descendant of Benjamin Rush, the physician signer of the Declaration of Independence in whose honor Rush University is named.

Chicago Mayor Richard J. Daley, who proclaimed September 14 "Rush University Day in Chicago," added his own words of welcome and said, "I have seen firsthand the dedication, the skill, and the genius of the men and women of medicine who are here at the Medical Center. I have seen the efficiency. I have experienced the kindness. And I am happy to say that I am living testimony to the results." Over two years ago, Mayor Daley was a surgical patient at the Medical Center, following a stroke.

Illinois Lieutenant Governor Neil F. Hartigan, participating on behalf of the people of Illinois, said "this magnificent university stands both literally and figuratively as a bridge between the academic research areas of higher education and the day-to-day need for quality health care for individual human beings." Mr. Hartigan allowed himself a personal note to say that "the four best things that have happened at Presbyterian-St. Luke's are all redheads," then named his children.

The dedication culminated a week of activities during which several thousand people toured the new Academic Facility. On September 9, a special luncheon was held for corporate contributors to the Medical Center. September 10 was the "Open House," when a special preview was held for members of faculties, medical, house and professional staff, students, employees, and all members of the Rush-Presbyterian-St. Luke's Medical Center family. On September 13, the Alumni Association of Rush Medical College held a series of dedication symposia in the new building in connection with the group's annual meeting.

James A. Campbell, M.D., Mayor Richard J. Daley, and Lieutenant Governor Neil F. Hartigan.

Guests browse in the Rare Book Room of the new Library.

McGeorge Bundy and Alexander Rush.

Exterior view of the new Rush University building

Edward McCormick Blair
Chairman of the Trustees

Rush University is one of the nation's newest institutions of higher learning devoted wholly to the training and education of professionals for the health field. Its roots, however, go back almost 140 years.

The Academic Facility is the first of 18 buildings on the Rush-Presbyterian-St. Luke's Medical Center campus to take its identity from Rush University. Learning experiences based here will go far beyond our campus. They will involve the faculty and students with all programs of the Medical Center, 10 hospitals and health care institutions in Chicago and Northern Illinois, and 14 Midwestern colleges and universities in the Rush Academic Network. Rush graduates entering careers in service will carry forward a unique tradition, strengthening the ranks of, and providing leadership for, the health professions in the state and the nation.

For sharing this ideal and participating in its realization, the Trustees respond with deepest appreciation to the medical and professional staffs and faculties, the students and their families, all employees of the Medical Center, the public and private institutions that supported our efforts, and the many good friends whose foresight and generosity made this academic achievement possible.

James A. Campbell, M.D.
President

In five years, Rush University has progressed from a concept to an active campus embracing three colleges—Rush Medical College, the College of Nursing, and the College of Health Sciences. It has held its second commencement. Its student body is close to the 1,000 mark, and will double in the next five years.

The great energies that the faculties have devoted to the innovative curricula and self-disciplined criteria of this new university are expressed in a building designed by them for their students. Here in the Academic Facility of Rush University are the physical prerequisites for classroom instruction, laboratory research, and private study—a $24,500,000 investment in education for the health professions.

For Rush-Presbyterian-St. Luke's Medical Center, the most important structural elements of the Academic Facility are those that link it to the patient care facilities of Presbyterian-St. Luke's Hospital, the Professional Building, and the Johnston R. Bowman Health Center for the Elderly. It will be even more important for our students—future physicians, nurses, medical technologists, scientists, researchers, and managers—whose education will include intensive clinical experience, firsthand observation of specialists ministering to those presenting a wide variety of diseases and injuries.

To these students I would address a personal word. Concern for the patient is the unifying force which will bind your humanity to your sciences, your service to your education, and yourselves to one another. It makes each specialty more special as it becomes a part of the whole. We wish you Godspeed.

After dedication, Mr. Blair chats with Mrs. Lou W. Beck who established the I.W. Waynick Fund in honor of her father, a Rush Medical College graduate, class of 1883.

Unusual Challenges and an Architectural Response

Rising on steel and concrete pillars to a height of six stories, the Academic Facility of Rush University bridges the Chicago Transit Authority elevated tracks at the fourthfloor level. Supports are designed so that an additional six to eight stories can be added should future growth require additional facilities. Still more space can be created by closing in the open area where the columns stand.

This unusual architectural solution responds to a number of factors and challenges: utilization of a narrow, long, and busy urban strip along Paulina Street adjoining the Medical Center; provisions for future expansion; traffic flow; positioning of academic and patient care elements of the Medical Center; and ability to move ahead on construction without disrupting patient care and other programs.

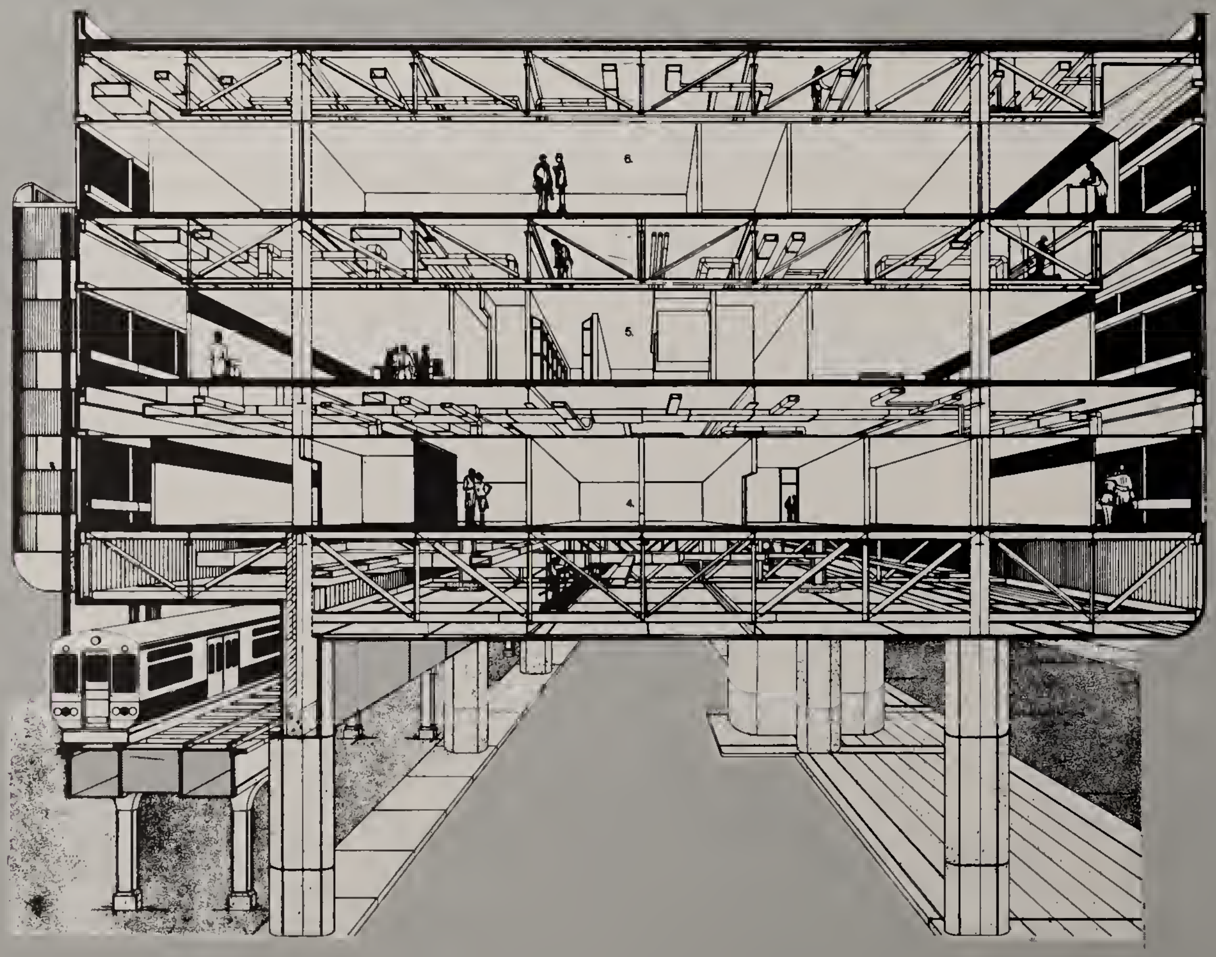
To solve noise problems presented by the rapid transit line over which the Academic Facility is built, acoustical controls include a sand-filled heavy concrete block wall with sealed joints covered with sound-absorptive panels, reflective hard membranes, and "flocking" of the structure with acoustical fibers. So effective are these controls that passage of trains goes virtually unnoticed.

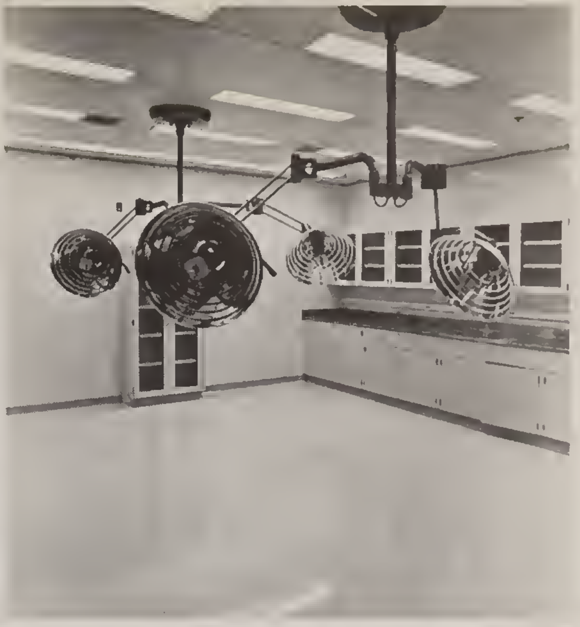
The aluminum and solar gray glass "skin" of the block-long facility presents a shining, streamlined horizon. Considerations in choice of materials included the need for lightweight materials required by the cantilevered construction as well as easily cleanable materials that will permit the building to look as new 50 years from now as it does today.

Special attention was given to effects created by choice of materials and color. Against a generally monochromatic background, incorporating natural woods and neutral colors, are juxtaposed richer, deeper colors. Skylights permitting natural light from outdoors to penetrate into inner offices enhance the decorative motif. The effect sought, and achieved, is warm, light, airy, dignified, and quiet.

The Academic Facility employs the relatively new concept of interstitial space—working space between floors high enough for a person to stand. Because renovation and modernization costs are traditionally high in facilities that must keep pace with new developments in science and health technology, architects designed work areas below the fourth floor, between the fifth and sixth, and above the sixth, where engineers can make necessary mechanical system adaptations without knocking out a wall or disturbing the users below. This will reduce substantially renovation costs in the future.

Pedestrian bridges connect the fourth level (really the first floor, which is up in the air) with the parking garage across Paulina Street and the Johnston R. Bowman Health Center for the Elderly. There are also connections at the fourth and fifth levels to Presbyterian-St. Luke's Hospital and at the fifth level to the Professional Building.





Some Reflections on Medical Education in America Today

Excerpts from the remarks of Alexander Rush, M.D., Associate Professor of Clinical Medicine, University of Pennsylvania School of Medicine, and Medical Director, The Benjamin Franklin Clinic. Dr. Rush is a direct descendant of Benjamin Rush.

Alexander Rush, M.D.

Dr. Benjamin Rush did not found Rush Medical College, but such an act would have been entirely in keeping with his character. Dr. Rush had demonstrated his deep interest in the education of the new America by founding Dickinson College in 1773 and subsequently taking an active role in the establishment of its neighboring Franklin and Marshall College in 1785. It is a likely supposition that Dr. Daniel Brainard was so influenced by Dr. Rush's views and activities in the field of education that he named his new medical school, founded in 1837, after the distinguished physician and patriot.

Medical education in America has passed through a number of important phases, reflecting for the most part the changing needs of society and changing economies. In the mid-18th century, there were no medical schools, and only a fortunate few were able to journey to Edinburgh or Leyden for formal schooling. The majority of "doctors" or "surgeons" had received no formal education, and were unlicensed, self-appointed practitioners who had learned by experience or by being apprenticed to successful practitioners.

Of the five physicians who signed the Declaration of Independence only one, Dr. Rush, had earned a degree in medicine. Upon graduating from the College of New Jersey at Princeton at age 15, Rush was apprenticed to Dr. John Redman, a graduate of Edinburgh and a physician practicing in Philadelphia. He endured the status of apprentice for "five and a half years with only 11 days absence." (Present day house officers take note!) Apparently recognizing the limitations of an apprentice system undisciplined by scholarly thinking, Rush went to the University of Edinburgh, where he came in contact with the most distinguished faculty of scholars and scientists that had ever been assembled in the English-speaking world. After completing his dissertation and receiving his medical degree, he remained in England. It was here the spark was generated that was to ignite his turbulent spirit. He strengthened friendships with Drs. John Morgan and William Shippen, both of Philadelphia. These two returned to America in 1760, and by 1764 the Trustees of the College of Philadelphia (now the University of Pennsylvania) were prevailed upon to establish the first medical school in the Colonies.

New York City was then a rapidly growing commercial seaport filled with several thousand sailors "of dubious morals and health." For their dubious morals, there were some 500 waiting prostitutes. For their health, there was "little but the hope that they were not bringing smallpox to the city!"

It was to answer the needs of the community that Dr. Samuel Bard, with a handful of others equally concerned, petitioned the Governor of Kings College (now Columbia University) for a "school of physick" and later for a new hospital that was to emphasize the triad of clinical practice, teaching, and research. The university schools, however, had not yet attained significant influence in the field of medical education. Proprietary schools assumed dominance of the medical scene. These privately owned for-profit institutions were an outgrowth of the informal approach of early colonial times. A tuition fee and little more than an ability to read and write were all that they required for admission.

The next great era in medical education followed the appearance of the Flexner report in 1910. In a surprisingly short period, the diploma mills faded into oblivion and the university schools, which embraced the scientific approach to the study of disease and the care of patients, became ascendant. Initially, the chiefs of service were either practicing physicians or physicians who only recently had retired from the practice of medicine. A generation of physicians grew up striving to emulate their chiefs, who were usually gifted in human wisdom, superb in clinical judgement, and imbued with genuine compassion for the sick and injured. This generation learned from their teachers what was required to be a successful practicing physician: the science as well as the art of medicine.

World War II was followed by the introduction of a dazzling array of discoveries and techniques that led to another great era in medicine. Spurred by Sputnik I, awed, and perhaps not a little frightened, the federal government quickly made available millions of dollars for research and training in the sciences.

The universities, including their medical schools, were not slow to take advantage of this opportunity. Government grants flowed freely to educational institutions in a position to expand academic and medical research. Positions as directors and department chairmen were given to academicians who had demonstrated ability to obtain research and training grants, thereby bringing prestige and money to the university.To these new leaders fell the responsibility of training a new generation of young physicians.

It is not surprising that the direction of their efforts was toward the production of "graduates steeped in the basic sciences and nurtured to become faculty and hospital-based specialists." The researcher and medical scientist soon assumed positions of reverence in the eyes of students, while the practicing physician, with his deep interest in the patient, became looked upon as some sort of second-class professional.

Some 1,300 attended the dedication.

Emphasis became centered on disease and what modern scientific technology might be able to do about it, not upon the unfortunate being afflicted with the disease. The voluntary practicing physician who chose to remain on a university faculty frequently had added to his academic title the qualifying word "clinical" to distinguish him from his elite full-time colleague.

This attitude spread to admissions. Faced with more applicants than they could handle, admissions committees began to rely almost exclusively upon grades and test scores to select future doctors. How often have I heard it said of a candidate, "I wish we could admit him, he would make a great doctor, but his grades and test scores indicate that he could not survive the intensely competitive academic environment!" Not enough weight has been given to those strengths of character that American society has long expected in its physicians: honesty, integrity, maturity, judgement, and, most important of all, compassion.

As a consequence of the preoccupation with advancing the science of medicine, educational planning committees today find themselves in the difficult position of having hastily put together sections or departments of family practice in order to meet the current demands for physicians better attuned to individual and societal needs. How many individuals on a full-time medical faculty in a typical university setting are qualified by experience to teach total care of the patient and family? The answer is few, if any, and certainly not enough. Recent graduates in medicine possess an awesome knowledge of the basic pathophysiology of disease coupled with supreme confidence in the ability of medical technology to solve all their problems. What they lack is a compassionate approach to the patient, who so often is bewildered, frightened, and desperately in need of human understanding. It is indeed sad to witness a young physician's failure to make the best use of his superb medical knowledge because his indifference or lack of understanding prevents him from obtaining the confidence of his patient.

Why do I take this occasion to criticize the American system of medical education that has brought us to such a high level of scientific skill? Because, upon studying the policies and programs of graduate medical education at Rush University and Rush-Presbyterian-St. Luke's Medical Center, I believe Rush is way out in front on the path to meet the new challenges and needs of our American society. By supporting a balanced program of patient care, education, and research, Rush has retained vitally important ingredients for training of needed physicians.

What, in my opinion, is of the greatest importance is the precedent of employing voluntary physicians as preceptors who, by their example, will set high standards of preception and performance. The basic philosophy of this institution would undoubtedly earn the acclaim of Dr. Benjamin Rush, whose name it so proudly bears.

Foreground: John S. Graettinger, M.D., Dean, Faculty Affairs, and Director, Graduate and Continuing Medical Education; left to right: James A. Campbell, M.D.; Neil F. Hartigan, Lieutenant Governor of Illinois; McGeorge Bundy, President of the Ford Foundation; Richard J. Daley, Mayor of Chicago; Alexander Rush, M.D., and Edward McCormick Blair.

E Pluribus Universitas: The Multiple Forces That Make Great Institutions

Excerpts from the remarks of McGeorge Bundy President, The Ford Foundation

McGeorge Bundy

As I read the record, the achievement being celebrated today rests upon three fundamental building blocks: first, a mixture of purposes that is both intellectually strong and socially defensible; second, a mixture of contributions that you have recognized as equally indispensable—the work of the professional, the time and money of the concerned citizen, and the support of public authorities; and third, an understanding among all parties to the enterprise that the diverse purposes of the institution cannot be met, and the varied contributions of its constituencies cannot be effective, without some shared commitment to the institution as a whole—to the university as such—and not merely to its diverse parts and parties.

If this understanding of your achievement is even partly right, it carries lessons for the whole world of the research university in the United States. Most of these lessons are those your experience teaches directly. First, there is *not* an inherent conflict between outstanding research and first-class care. It is an illusion to set the ivory tower and the workaday world in opposition to each other. In the end they live together or neither lives well.

A second proposition is equally simple: There is no first-class university which does not recognize the rights and roles of more than one constituency. I have been a faculty dean, and I have argued that if one should have to choose to put one constituency ahead of another, the faculty must come first.

But when such choice has to be made, in terms of confrontation, something is already wrong. Your example teaches the lesson that the quality of investigation, the integrity of teaching, and the execution of concerned professional service require understanding and support from a wider world than that which is informed by the intellectual choices, however powerful and imaginative, of individual scholars and scientists.

The third and largest lesson I would draw, however, is one I do not dare to pull from your experience. I draw it, rather, from a more general observation of the condition of higher learning in America. It is the lesson of the need for understanding of these institutions by all whose future depends upon their continuing help and strength, and especially for a renewal of such understanding in our federal government.

What we need is nothing less than a renewal of a basic partnership between the federal government and the research university, which began in the middle of World War II and flourished for almost a quarter of a century—and which has been gravely damaged over the past 10 years.

Let me illustrate this difficulty from a single field—that of federal support for basic research. Since it reached its high point in 1968, the level of federal support for basic scientific investigation has declined, in constant dollar terms, by more than 20 percent.

And what was even more serious than the economic damage was a decline of mutual trust and confidence. One need not believe that all of the responsibility fell on one side to recognize that in the past 10 years there has been a growing gap of mutual understanding between the American government and the American scientific community. Perhaps the scientists assumed too readily that the relatively open and expanding environment of the Fifties and early Sixties could continue indefinitely. Certainly they did not anticipate that on the side of the federal government the original notion of a partnership for common basic purposes might be replaced

Dr. and Mrs. David I. Cheifetz and Rush University Library Director William Kona.

Left to right: James A. Hunter, M.D.; James A. Campbell, M.D.; Alexander Rush, M.D.; and McGeorge Bundy.

Invocation

Eternal and loving God, we sincerely thank You for the coming of this day of celebration and dedication. Accept our gratitude for those whose vision and work have made this academic facility possible, for those who saw the need and who dared to dream, to act, and to give. For administrators, architects, contractors, and workers who planned, designed, and built. For teachers and scientists who may now use their abilities more fully. For students who have accepted the disciplines of medical learning. For the thousands of people in this city and beyond, in both the past and the present, who have labored for the benefit of this institution and its mission of healing and help. We thank You Lord. We pray You will bless this renewed venture of service and medical education. As life comes within these walls, we dedicate ourselves to the training of physicians, nurses, and health professionals who have a genuine concern for their patients, an awareness of disease of all people in this society, a devotion to the truth, and a commitment to excellence in all facets of medical education and practice. Sustain and guide all who seek knowledge and skill here, grant them strength, courage, and a continuing idealism that does not wane. This we ask in the name of Jesus Christ, Our Lord. Amen.

The Rev. Ross M. Ludeman
Community Presbyterian Church
Clarendon Hills, Illinois

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in many agencies by the concept of a mere purchase of services. One qualified set of observers put the change this way:

"With regard to the support of research, universities are viewed as one among many types of competing institutions that can provide useful information to mission-oriented federal agencies. Research results are a commodity that agencies can purchase as necessary from universities or any other competent supplier."*

The misunderstanding here is fundamental. The fact is that neither basic research nor the university, which is the principal American home, can flourish if subjected to tests and values of the commercial market place. Nor can the long-run needs and interests of the federal government be met merely by the purchase of mission-oriented research results.

Fortunately, the true view of the matter is neither strange nor new. It is the view exemplified in this university, that there is no inherent conflict between basic research and effective, daily application of what is known and understood. Thus, investigators of this institution, I am sure, would agree with what was written almost 20 years ago in a report that was warmly welcomed by President Eisenhower.

"The most impractical thing that can be done in designing and directing programs of scientific research is to worry overmuch about how 'practical' they are."

It is equally unwise to suppose that the quality and quantity of scientific investigation are best measured by the standards of the time clock or the cost accountant. The extraordinary achievements of American science and scholarship over the quarter century between 1943 and 1968 were based upon different concepts altogether—those of partnership and trust.

Yet, I am as far as can be from urging that scientists or anyone else should be excepted from the basic social requirements of fiscal integrity and intellectual accountability. My point is precisely that these high standards can never be enforced by a distant bureaucracy, but only by the mutually reinforcing constituencies of a university that has its own unbreakable commitment to integrity and excellence.

The federal government is not, of course, the only critically important contributor for better or worse to the American university. Indeed, the diversity of its economic support is yet another unique and happy element in the historic pattern in which Rush University is such an unusual exemplar.

It is fortunate for the American university world that—even in its decades of greatest prosperity and expansion—its leaders never assumed they should turn to Washington alone. The appeal for renewal of mutual trust and partnership, which is increasingly heard today, would be much less persuasive if it did not rest on a deep foundation of self-confidence and autonomous strength.

Rush University, along with its boldness, exemplifies this self-confidence and strength, just as it exemplifies the indestructible connection between science and service.

From such a platform, it is fair to speak to those who make decisions in our government and ask them quite simply for a renewal of the national partnership between government and the university in pursuit of excellence.

*****Outlook and Opportunities for Graduate Education, The Final Report, With Recommendations of the National Board on Graduate Education, Washington, 1975, p. 77.*

Benjamin Rush—Heritage and Hope

By C. Frederic Kittle, M.D.

In his biographies it is stated simply: *Benjamin Rush—patriot, physician, and psychiatrist* (1745-1813).

To some he was innovative and daring, while others thought him revolutionary; to some he was determined, to others compulsive and offensive; to some he was noble and compassionate, to others this was only his self-image of saintliness. He made countless friends and admirers, as well as innumerable bitter and angry enemies. His reputation is marked by controversy, and arguments abound regarding his exact role in any one of the numerous encounters that filled his life.

No one can deny, however, that he was the first great physician in the United States; no one can deny that for at least 100 years his influence and presence were felt in virtually every sickroom in the United States. He lived—and flourished—in a unique world, those years before, during, and after the Revolutionary War, in the new soil of this great democracy. He believed that God had selected the 18th Century as an age for an enlightened inquiry into truth, and that he, Rush, was His agent.

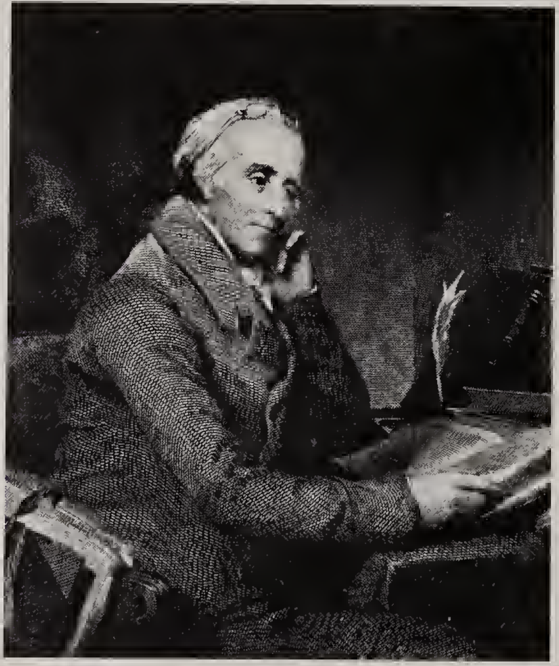
We should begin with Rush as the Revolutionary patriot, since this is what first brought him to fame. There were many crucial moments during the beginning days of this country, but none of more importance than one evening in the fall of 1775. Dr. Benjamin Rush, aged 29, had just finished seeing his last patient and was awaiting a visit from the Englishman, Thomas Paine. Paine, at the suggestion of Benjamin Franklin, had been encouraged to come to America.

His articles on slavery impressed Rush and made him realize what a powerful writer Paine was. The question that concerned Rush now was whether Paine, an Englishman who had been in America less than a year, could and would write articles about English tyranny for America.

The War for Independence had been going on in earnest since April 19, 1775, and American colonists had shown their worth against the British professionals in war. But the people needed more courage, enthusiasm, and, most of all, a feeling of patriotism.

Then the housekeeper announced Paine. Immediately, the two achieved a rapport based on Paine's frankness, his interest in the "common people," his background of working as a common laborer, and their common dislike for the British Constitution. As Paine expressed it:

". . . if America wins her independence she can trade wherever she likes . . . and pay no tax tribute to England for the privilege. It is ridiculous that a little tail the size of England should wag a vast continental dog. Must 3 million people flock to the shore every time a vessel arrives from England to find out how much—or how little—liberty the British wish them to enjoy?"



Benjamin Rush (1745-1813).

But, as Rush pointed out, there were many Americans who did not favor independence and were content to have a friendly relationship with the English. What Rush thought should be done was to organize people in America to fight *for* America, not *against* the mother country. Rush gave Paine some notes he had jotted down that expressed thoughts about independence. Because Paine was a skilled writer and an excellent pamphleteer, Rush attempted to persuade him to write an article stressing the need for America to separate from England. Paine finally agreed.

"What will you call the pamphlet?" Rush asked. "Have you any idea?"

Paine considered. "It will contain nothing but the plain truth," he said. "Perhaps that would be a good title."

"'Plain Truth,'" Rush said, trying it out. "Yes, that's good. But truth can be plain to some and not to others. We want a truth that is plain to everybody with common sense." He snapped his fingers. "I think we've got it. Let's call it 'Common Sense.'"

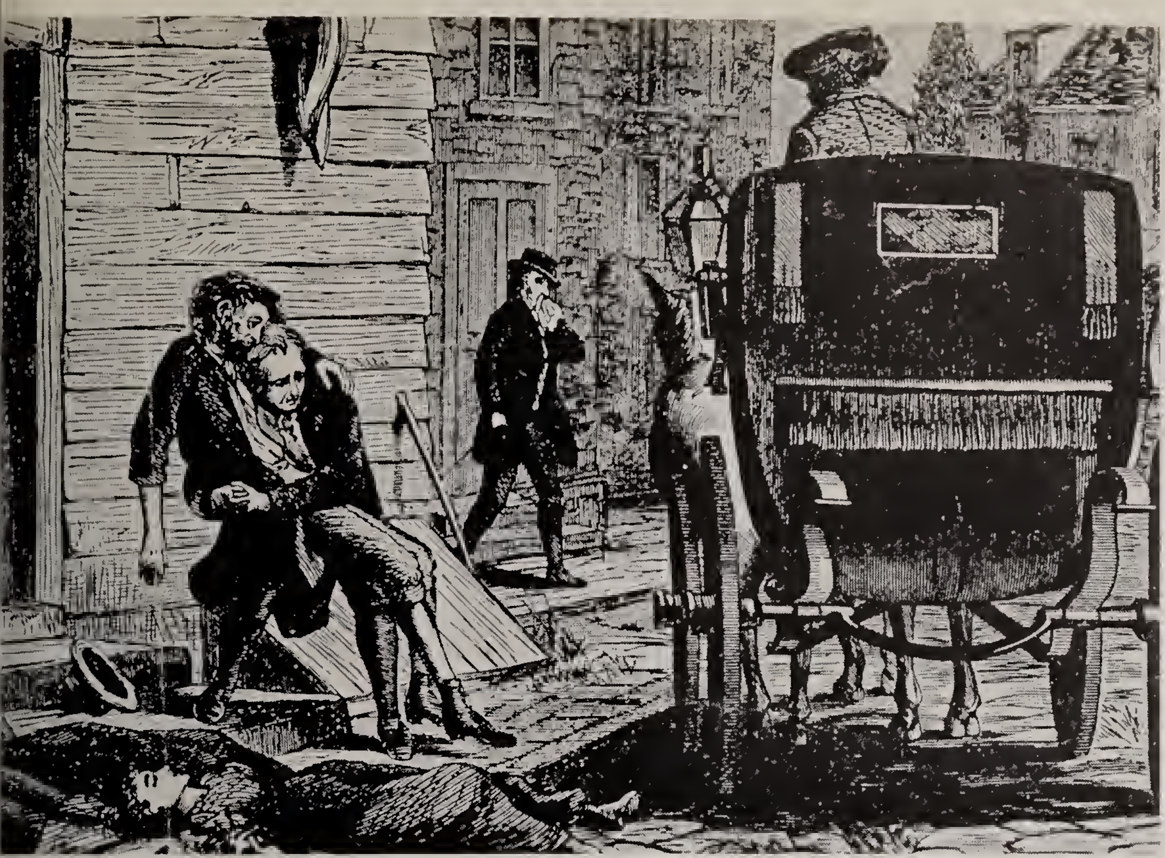
And so Paine's famous article was born. Its effect was immediate and profound. Thousands of early Americans who were wavering about independence, about the difficulties of winning, and other thousands who proclaimed their desire for America to remain a colony, were convinced by the brilliant persuasiveness of Paine that America should become a separate and free nation.

Benjamin Rush's desire for independence did not arise suddenly or from a single source. He had entered the College of New Jersey at Princeton, later to become Princeton University, when he was 13. "I was an idle, playful, and, I am sorry to add, mischievous boy," yet he demonstrated such talents for public speaking that he decided to become either a lawyer or, second best, a minister. His uncle, the Rev. Dr. Samuel Finley, principal of Nottingham School, discouraged him.

"You are a close observer, Benjamin, and a painstaking workman. You also have a kind and gentle heart. These are qualities that grace a doctor of medicine. I think you ought to consider the medical profession." And so Rush, at the age of 15, filled with enthusiasm, a graduate of Princeton, his ears ringing with compliments and admonitions, chose medicine as a career.

He became apprenticed to Dr. John Redman, an outstanding teacher and physician in Philadelphia. Redman's initial advice and encounter with Rush was to be remembered throughout his life.

"Is it your custom to sleep all day, young man?" Redman asked, and then continued, "As my apprentice—if you remain my appren-



Yellow fever epidemic in Philadelphia, 1793. Carriages rumbled through the streets to pick up the dying and the dead.

ice—you will learn to live on very ittle sleep."

And then he went further: "I am not sure that I was wise in accepting you. Oratory, they say, is your only claim to fame. A sickroom, the walks of a hospital, a surgical theater, are places of silence—except, of course, for screams of agony and groans. Eloquence has never set a broken leg or charmed away a fever. If you study under me you will be seen but not heard, speak only when spoken to." And Redman persisted with a comment, as true today as it was 200 years ago:

". . . Medicine is above all the art of learning to live with discouragement and to keep on going—groping through darkness and superstition."

Rush's apprenticeship lasted five and a half years, each day filled to the brim with exhausting tasks: accompanying Redman on his rounds, preparing medications, studying and memorizing the classics in medicine, particularly Thomas Sydenham and Hermann Boerhaave. During these five and a half years, he was absent from Redman's practice only 11 days and spent only three evenings away from his house.

Dr. Redman encouraged him to study abroad, and, in September, 1766, he was off to Edinburgh, at that time one of the outstanding medical centers of the world. He presented himself to Dr. William Cullen, professor of *materia medica* at the Medical College. Rush also furthered his knowledge of chemistry by attending the lectures of Joseph Black. He was 22 when he received his medical degree from the University of Edinburgh, after completing a doctoral dissertation based on self-experimentation about digestion in the stomach, "*De Coctione Ciborum*." The conclusions were erroneous, but his ingenuity in experimentation inspired others.

Classes did not occupy all of his time, however, and at an evening dinner he met David Hume, the canny Scottish historian and philosopher. The logical and constant examination that Hume gave to every conversational topic undoubtedly influenced the approach of Benjamin Rush to new or controversial problems.

Cullen considered Rush a brilliant protege and gave him letters of introduction for a tour to London and Paris. He made many new friends and acquaintances: William Hunter, Samuel Johnson, Oliver Goldsmith, James Boswell, and Augustine Roux, to mention only a few. Many were filled with revolutionary thoughts about the tyranny of kings and the virtues of democracy.

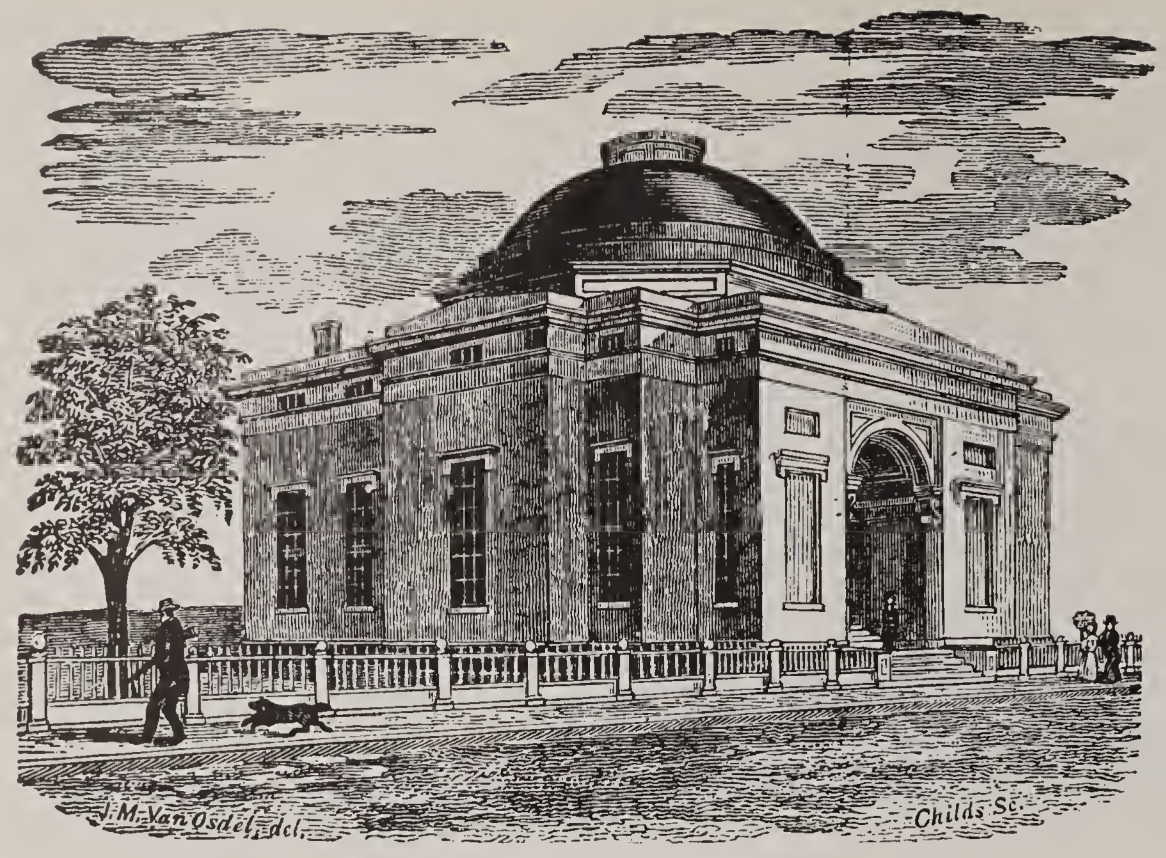
On his return to Philadelphia in 1769, Rush was admirably suited to cope with the problems of the English Colony in America: the burgeoning of Philadelphia as an international port and the leading city in America, the continuing struggle against British oppression, and the almost hopeless confusion in the care of sick patients. He was soon appointed professor of chemistry at the College of Philadelphia (now the Universiy of Pennsylvania Medical College).*

His first interest was in one of the social problems, slavery. In 1772 he published "On Slave-Keeping," describing vividly the events in a slave market. This promptly brought forth much animosity from slave owners. Rush also helped to organize the first antislavery society in America in 1774, and succeeded Benjamin Franklin as its president several years later. These activities gave him the label of "political" doctor, and he was unpopular not only with the wealthy pro-slavery men, but also with his fellow doctors, who thought he should devote himself solely to the medical profession. His practice prospered, nonetheless.

His interest and participation in politics continued. He was adamant in his opposition to the taxation on

Sketch of Chicago, about 1837.

**His book (1770) "Syllabus of a Course of Lectures on Chemistry" helped earn him the title of first American chemistry teacher.*


J. M. Van Osdel, del.
Childs Sc.

The first Rush Medical College.

tea, which, although not burdensome, was symbolic of continued British tyranny—taxation without representation. As Rush noted on October 10, 1773 (titled "On Patriotism" and addressed "To His Fellow Countrymen"):

"Patriotism is as much a virtue, and is as necessary for the support of societies, as natural affection is for the support of families. . . . We are informed that vessels were freighted to bring over a quantity of tea taxed with a duty to raise revenue from America. Should it be landed, it is to be feared that it will find its way amongst us. Then farewell American Liberty. . . . Let us with *one* heart oppose the landing of it. The baneful chests . . . contain something worse than death—the seeds of *slavery*."

Ships did arrive in Boston in December, 1773, where a number of Bostonians disguised as Indians held the fateful Boston Tea Party. The British Parliament was quick to retaliate by passing the "Intolerable Acts," including these: Boston harbor could not be opened until the tea had been paid for, and Bostonians were to quarter British troops in their homes. Outraged Americans asserted their rights. As Benjamin Franklin put it, "We shall hang together or hang separately," and in his desire to "hang together" he was joined by Benjamin Rush, Samuel Adams, John Adams, John Hancock, George Washington, Thomas Jefferson, and Patrick Henry.

When the First Continental Congress convened in September, 1774, with a total of 55 delegates from all the colonies, Rush was on the committee to welcome them to Philadelphia. Some, such as John Adams, thought him too zealous, too radical in his thoughts about freedom. The Congress inspired Rush to the utmost in patriotism, and he wrote letter after letter to the press.

By the actions of this Congress, imports from England were drastically reduced. British trade declined throughout the colonies by more than 90 percent from the previous year. After only a few months the famous encounter at Lexington took place on April 19, 1775, and the "shot heard round the world" was fired. The American Revolution had begun.

And now it was December, 1775. Paine and Rush met for the second time. The small manuscript lay on the table between them. Paine looked at his friend and grinned.

"Well, doctor," he said, "there's our baby. Do you think it will live?" Rush replied, "I'm sure it will. It will live to make a big noise in the world. You have done a magnificent piece of writing." Rush found a publisher for the pamphlet "Common Sense" by Thomas Paine, and overnight the little book became famous. This was no humble remonstrance for independence; it breathed fire and brimstone. It singed the beards of kings everywhere: "The heathens paid divine honors to their deceased kings, and the Christian world has improved on the plan by doing the same to their living ones. . . . Of more worth is one honest man to society than all the crowned ruffians that ever lived." Paine went further, and discussed the British constitution: "It is the most complicated, irrational, and ridiculous contrivance ever devised to govern enlightened men."

Alone, this booklet written by Thomas Paine effected a profound change in the discouraged and uncertain early Americans. Their thoughts and support were solidified for the Revolution. As George Washington said: "I find 'Common Sense' is working a powerful change in the minds of men."

Rush became even busier as the weeks and months advanced toward an open declaration of independence. He was primarily responsible for eradicating the Tory-dominated Pennsylvania Assembly and establishing a new body solidly in favor of independence.

And so the Continental Congress declared independence on July 2 and 3, 1776. The formal Declaration was adopted on July 4 and signed that day, but only by John Hancock with his bold and flamboyant signature. Rush,* a delegate from Pennsylvania to the Congress, signed the Declaration of Independence on August 2, and thus joined the company of the 56 other illustrious Americans who did so.

In midsummer, 1776, General Washington took his Army from Boston to face the British on Long Island, and the war was begun. The next Spring, Rush was commissioned as surgeon general for the Middle Department, where the next 10 months were to be a strife-ridden period for him.

Health conditions among soldiers were abominable. Virtually no attention was given to their personal cleanliness, their foodstuffs, or to their care when disease occurred. Typhus fever was rampant and smallpox was common.

With his characteristic acumen, Rush noted that more illness occurred in crowded conditions than elsewhere, that disease ran concurrently with a previous state of ill

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**According to some Rush was the only physician with formal training, but there were three others who practiced medicine: Josiah Bartlett (New Hampshire), Lyman Hall (Georgia), and Matthew Thornton (New Hampshire).*

health, and struck more poverty-stricken soldiers than those who were well-fed, well-clad, and well-housed.

It was not long before Rush published a military manual, "Directions for Preserving the Health of Soldiers." This was a pioneer work in military hygiene. Reissued at least twice during the Civil War, it was reprinted as late as 1908. The advice would be considered elementary today—a soldier should wash his hands and face at least once a day, not sleep in wet clothes, garbage and waste should be disposed of properly, campsites should be some distance from marshes and swamps, the diet should include well-cooked vegetables, and exercise should be part of the army routine.

Hospital facilities during the American Revolution were hopelessly inadequate, and were made even worse by the poor organization of the Army Medical Department. The original plans for our Army of 20,000 men recommended only 29 doctors, assistants, and druggists, and one nurse for each 10 patients. When Rush discovered that the British hospitals under General Howe's command were much better staffed, equipped, and supplied than the American hospitals were, he was even more exasperated.

Rush, enthusiastic gadfly that he was and appreciating what good military medical care should be, lost no time in starting a campaign against the corrupt medical system. It was inevitable that his letters, suggestions, and criticisms should irritate his superiors, notably Dr. William Shippen, and finally precipitate a Congressional hearing. In desperation, frustrated at his inability to institute what he believed were necessary and honest reforms, Rush resigned. General Washington was also disturbed by critical remarks Rush had made about him. The findings of a second hearing, held several years later, agreed with Rush's claims, and Congress adopted many of the reforms he had suggested.

Although Rush was to retain a deep and undying interest in politics throughout his life, the pre-Revolutionary and Revolutionary years saw the height of his patriotic activities. For the remaining part of his life, he devoted himself almost exclusively to medicine.

After the British left Philadelphia in 1778, Rush returned to his beloved city. The British had left Philadelphia a filthy mess, and there was sickness everywhere. Rush plunged into the care of the sick with his habitual energy and verve. A new system of medicine had been instituted by Rush before he left for the War. Early Colonial medicine was largely based on home remedies, and there was no such thing as a license to practice medicine. The practitioners who treated the sick generally did so according to the system set forth by the famous Dutch physician, Hermann Boerhaave.

Eighteenth Century medicine, like its poetry and theology, had little interest in the observation of Nature. According to Boerhaave, the body's "humors" were the basis of therapy. All disease could be blamed on morbid acrimonies that could be purged from the body through the urine, through the pores of the skin, or by blood-letting.

While in Edinburgh, Rush had been persuaded by Cullen to discard Boerhaave's notions as too speculative. According to Cullen, all diseases were due to disorders of "nerve force." Also, since classification was fashionable at this time, Cullen had divided diseases, according to symptoms, into classes, genera, and species—1,387 in all. He opposed blood-letting, and put his faith in a hierarchy of drugs. A physician merely had to fit the patient's symptom into Cullen's classifications and then apply the remedy he listed.

On his return to Philadelphia, Rush, an ardent disciple of Cullen, convinced other physicians by his enthusiasm that they should adopt the Cullen system. His belief in Cullen's system did not last long, however, and he soon developed his own system to replace that of Cullen.

Briefly, Rush maintained that every fever was due to "excess excitability" of the blood vessels. All fevers were essentially the same. Thus Rush boldly reduced the hierarchy of fevers as described by Cullen from many to one, and reduced the *materia medica* from hundreds to about 20. Obviously, with a fever or, as translated by Rush, an increased excitability of the blood vessels, one should decrease the excitability by purges, salivations, and particularly by blood-letting. He speaks of withdrawing as much as 100 ounces of blood, and then returning to withdraw more.

In other areas, he sponsored many social reforms, criticizing unjust sentences imposed for minor civil offenses, and capital punishment, and urging temperance in the use of alcohol. In 1783, he became a member of the Pennsylvania Hospital staff.

Teaching at the University of Pennsylvania kept Rush busy. Later, he was to enlarge his medical practice by adding a mail-order advice service. It was by mail that he advised the treatment of Mary Washington's

Doctors and students posed in the ashes of the college after the Chicago fire.

carcinoma of the breast, a treatment that did not work well because Mary died one month later.

Rush was particularly concerned with medical care for the indigent, and treated thousands of them without charge. For years he attempted to obtain adequate hospital facilities for the poor, and finally, on April 12, 1786, the Philadelphia Dispensary was opened, the first free clinic in America. Soon thereafter Rush became interested in general education, founding Dickinson College and campaigning extensively for free schools and education for women. In 1792, he became professor at the recently established (1791) University of Pennsylvania.

During the 1790s, Philadelphia had several epidemics of yellow fever. Indeed, in 1793, 10 per cent of the city's population died. To Rush, it was obvious that the foul sanitary conditions of the city were largely responsible, although he antagonized the city fathers and businessmen by such proclamations.

It is a tribute to the courage, devotion, and physical sacrifice of Rush that he remained in Philadelphia to care for the sick and dying during these great yellow fever epidemics. He racked his mind for some treatment that might lessen the high mortality rate. As he wrote his wife, "The common remedies for malignant fevers have all failed." Then he recalled a paper written by Dr. John Mitchell describing the yellow fever epidemics in Virginia half a century before. Purging and bleeding were advised.

So Rush, initially over the objections of his colleagues but later with their support, began to purge and bleed. Calomel and bloodletting. Never mind the pulse. It could be weak, but if the fever persisted, take off more blood. The following years brought new epidemics, and Rush continued purging and bleeding with renewed vigor and, according to some, an increasing mortality rate.

Rush, the practitioner and clinician, was greater than Rush, the theorizer on the cause and cure of disease. His best attributes were the astuteness of his bedside observations and the diligence of his medical care.

It was Rush who first stressed careful observation of patients and insisted on keeping careful records of their progress. This sounds elementary now, but these practices were innovations then. "Medicine cannot be practiced by books alone," Rush said. "One might as well try to swim by reading." Thousands of students and colleagues were influenced and inspired by him. He exemplified the best qualities of his age: humanism, optimism, and a fervent belief in progress through knowledge.

As a staff member at the Pennsylvania Hospital, he developed an interest in psychiatry, undoubtedly accentuated when his young son John had to be hospitalized in the insane ward of this hospital. Two questions about psychiatry plagued Rush for many years of his life. How do people go mad? Is it possible to cure madness?

Daniel Brainard (1812-1866).

At the time, people were thought to be mad because they were possessed by the devil (compare the interest in exorcism today) or because they were suffering for their sins. Rush was the first American to proclaim that mental illness was a disease and, for this alone, without regard to all his other contributions, he justly deserves the title, the Father of American Psychiatry.

As might be expected, Rush developed a theory, actually several theories, to explain mental illness. He believed there was an "inflammation" of the brain; he believed there were "disordered actions" in the blood vessels, but he also listed many other causes of insanity.

For treatment of mental illness, Rush thought the "morbid excitement" of the brain should be reduced. Previously, treatment for insanity was aimed chiefly at punishing the patients for their sins, often quite brutally. What would really help? Rush did not know, but he tried a variety of treatments: alternating hot and cold baths, immobilization to decrease blood flow, centrifuging to increase blood flow to the brain, and numerous types of sudden stimuli. In 1812, he attempted electric shock therapy, the first time this had been used.

But for every patient, he insisted upon just and humane treatment, a pleasant surrounding, recreation and occupational therapy, the lack of undue stress, and the writing or talking by the patient of his symptoms, or, as we know it, mental catharsis.

His last years were distinguished by an increasing recognition of his medical fame not only by the profession in the United States, but also in Europe. His death came in 1813 after a short illness, probably pulmonary tuberculosis, and after he had insisted that he be bled.

Let us look at the site of Rush University as it was only 24 years after the death of Benjamin Rush. In 1837, Chicago was little more than a collection of hastily constructed, flimsy huts in a swamp on the edge of Lake Michigan. The population was only 4,000, but the people had a sense of destiny. The country was fertile, and already a canal had been planned to connect the lake with the Mississippi River.

One year previously, Dr. Daniel Brainard (1812-1866), aged 24, had arrived in Chicago from the East. As a Chicago lawyer, Judge John D. Caton, described his arrival:

"Dr. Brainard rode up to my office on a little Indian pony. He was dressed rather shabbily, and said he was nearly out of funds, and asked my advice about commencing the practice of medicine in Chicago. I knew he was ambitious, studious, and a man of ability, and I advised him to go to the Potawatomi camp, where the Indians were preparing to start for a new location west of the Mississippi River, and sell his pony, take a desk, or rather a small table I had in my office, and put his shingle by the side of the door, promising to aid him in building up a business."

Brainard's willingness to work and his surgical skill quickly won him the respect and patronage of the early settlers.* As he wrote:

"...I have reason to praise God, in that it hath pleased Him to call me to that branch of medical practice, commonly called surgery, which can neither be bought by gold nor by silver, but by industry alone and long experience."

But he had taught physiology at the Oneida Institute in Whitesboro, N.Y., and could not suppress his interest in medical education and teaching. He recognized the need for a medical school in this area and, combining this with his enterprising spirit as a pioneer, he decided to start a medical school.

What should the new school be called? It should commemorate a famous physician: someone esteemed for his care of the sick, someone devoted to medical education. The name was really no problem—Benjamin Rush—and Rush-called forth memories of a great patriot in the War for Independence. Brainard had heard much about him during his school days at Jefferson Medical College. Yes, Rush Medical College—that would be fine. The school received its charter in 1837, only a few days before the City of Chicago.

What were the medical needs of the Midwest when Rush classes began (1843)? In addition to almost abyssmal ignorance about heart disease, tuberculosis, childhood diseases, obstetrics, malignancies, and the delivery of health care, there were the epidemics of malaria and cholera. Indeed, in 1866, during the cholera epidemic, Chicago averaged 100 deaths per day. Another need was medical care for the indigent. The Charity Dispensary of Chicago had opened in 1839 and with the commencement of classes at Rush Medical College in 1843 the dispensary was transferred to this school.

Much has happened since 1843. Rush Medical College has indomitably withstood the trials and tribulations of these years, including its total destruction by the Great Chicago Fire of 1871 and moving to a number of different locations. Since its revival in 1971 (its charter never became inactive), we cannot help asking and wondering about our identity. Are we a new breed? Are we upstarts or traditionalists? Is there a thread that ties us to the past?

What would Rush and Brainard see if they were to visit today? They would hear our president, James A. Campbell, M.D., publicly describe Rush University as having an "... individual and institutional commitment...to sustain the healthy and help the sick.... The question of responsibility goes beyond self and must reach out to the society of which we are a part....

"...Rush University [is] a principal element in a network of relationships of care and education designed to sustain the primacy of our care for the patient.

James A. Campbell, M.D.

"At Rush University we have put great faith in the power of example and the validity of personal relationships as essential to learning. These we hope will continue to give a sense of distinction and an obligation to carry into the future."

Rush and Brainard would see an imaginative approach by this Medical Center designed to achieve the best in medical care through a system of network hospitals with an appropriately located core of specialists. The major illnesses of the Twentieth Century, malignancies and cardiovascular ailments, are being dealt with effectively, and there are large clinical research projects investigating these diseases. They might nod approvingly at the plans developed to provide comprehensive health care and medical help for indigent citizens in this area. And, inside the hospitals and classrooms, they would see the education of students and practitioners and meticulous care of the sick, both practiced with the same relentless diligence and devotion that characterized each of their lives.

I think they would agree that the concepts they believed in are still living in these halls and in this faculty.

As Benjamin Rush said:

"The physician has lived to little purpose who does not leave his profession in a more improved state than he found it."

And Daniel Brainard proclaimed at the inauguration of Rush Medical College:

"To elevate the standard of skill and knowledge in the profession, to excite an honorable emulation among its members, to disseminate in this new region the principles of medical science...such are the objects held in view by the founders of this institution."

Yes, we have a strong and precious identity; the guiding principles of the past are a part of us today.

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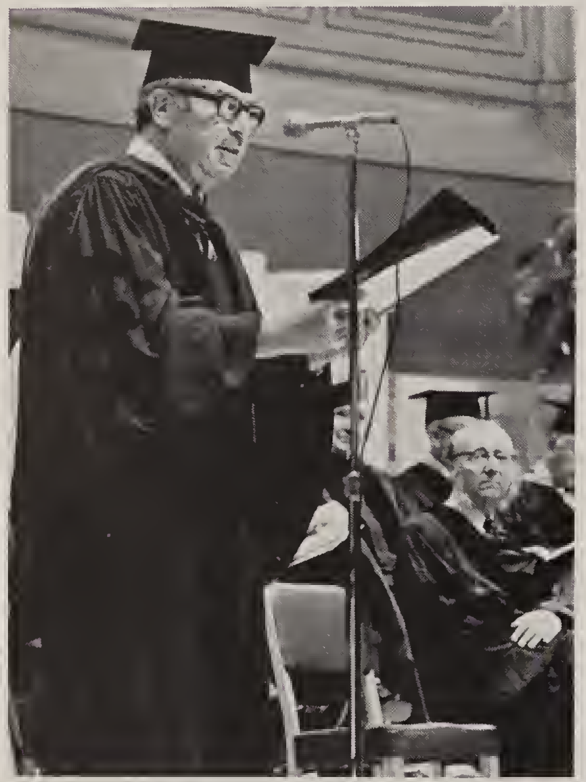
He distinguished himself by being the first to treat ununited fractures by wiring, and by doing research on rattlesnake venom and the treatment of wounds with iodine.

Dr. Kittle is Professor of Surgery and Director of Thoracic Surgery, Rush Medical College, Rush-Presbyterian-St. Luke's Medical Center, Chicago, Ill. The above article is based on a paper presented at the annual meeting of the Alumni Association of Rush Medical College, September 13, 1976.

1976 Commencement



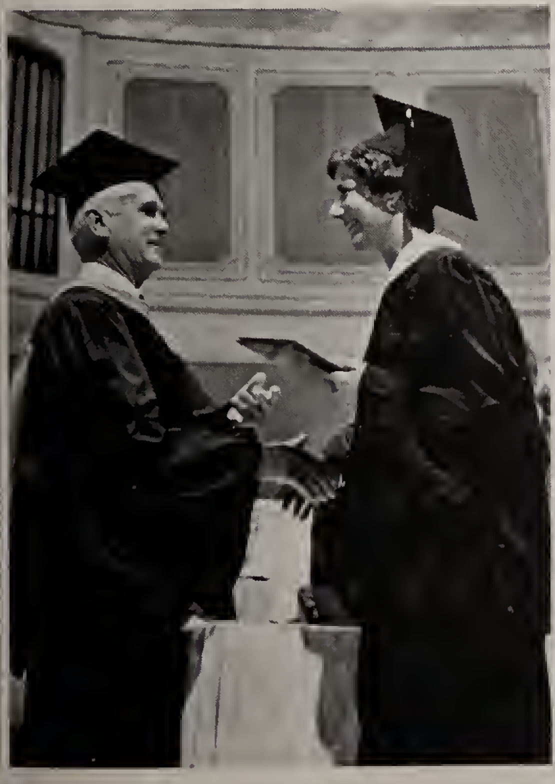
Rush University Confers 212 Degrees, Two Honorary Doctor of Science Degrees

Edward McCormick Blair, Chairman of the Trustees, and James A. Campbell, M.D., President of the Medical Center, conferred degrees upon 212 graduates at the second full commencement of Rush University on June 12.

Fifty-two received the degree of Doctor of Medicine, 25 the Master of Science degree with a major in nursing, 8 the Master of Science degree with a major in clinical nutrition, 109 the Bachelor of Science degree with a major in nursing, 15 the Bachelor of Science degree with a major in medical technology, and 3 the Bachelor of Science degree with a major in medicine.

Honorary degrees of Doctor of Science were conferred upon James Harvey Young, Ph.D., Professor of History at Emory University, Atlanta, and Jessie M. Scott, R.N., M.A., Assistant Surgeon General and Director, Division of Nursing, Health Resources Administration, U.S. Department of Health, Education and Welfare. Dr. Young presented the commencement address, entitled, "Health Quackery: An Historian's Advice" (see page 54).

To conclude the ceremony, the graduates stood and turned to face the audience to recite together "The Oath of the Health Professional," written by Peggy Ward, graduate of the College of Nursing.



Edward McCormick Blair presented diplomas.

Jessie M. Scott, Honorary Doctor of Science

Jessie M. Scott, R.N., M.A., and Luther Christman, R.N., Ph.D.

Jessie M. Scott is Assistant Surgeon General and Director of the Division of Nursing for the Health Resources Administration of the U.S. Department of Health, Education and Welfare, a position she has held since 1964. During her long association with the Division of Nursing, she also served as nurse consultant and deputy chief.

Miss Scott has held office in the American Nurses' Association, the National League for Nursing, and the Pennsylvania Nurses' Association, and she is an active member of numerous organizations concerned with the advancement of health care, higher education, and the nursing profession. She is a member of the National Advisory Committee of the W.K. Kellogg Foundation and the International Council of Nurses.

As a practitioner and an educator, Miss Scott has served on both the faculties and the staffs of the University of Pennsylvania and the St. Luke's Hospital in New York City. She has also been educational director at Mt. Sinai Hospital in Philadelphia.

A native of Wilkes-Barre, Pa., she received a diploma in nursing from the Wilkes-Barre General Hospital School of Nursing, the B.S. degree from the University of Pennsylvania, and the M.A. degree from Columbia University.

Jessie Scott has been nationally recognized and honored for a distinguished career and creative leadership in the development of a national program in support of nurses training. She has published widely in nursing education and has served as a member of an international team for on-site studies in nursing. Last year she was a member of the Health Resources Administration team invited to Egypt to evaluate the training programs of the Ministry of Health.

James Harvey Young, Honorary Doctor of Science

James Harvey Young is Professor of History at Emory University in Atlanta, Ga. He is a scholar of America's social, intellectual, and medical history, and has studied extensively the course of food and drug regulation in the United States. In two books, "The Toadstool Millionaires" (1961) and "The Medical Messiahs" (1967), Professor Young has focused on health quackery in America through the eyepiece of historical analysis. In "American Self-Dosage Medicines" (1974), he examines the regulatory history of proprietary medicines. His books and articles have been translated into foreign languages, and he has won awards "for distinguished historical writing."

Among his professional activities, Professor Young has been a member of the Food and Drug Administration's National Advisory Council, the History of Life Sciences Study Section of the National Institutes of Health, the Consumer Task Force of the White House Conference on Food, Nutrition, and Health, and the Board of Consul-

James A. Campbell, M.D., and James Harvey Young, Ph.D.

tants of the National Endowment for the Humanities.

Born in Brooklyn, N.Y., James Harvey Young received the B.A. degree from Knox College and the M.A. and Ph.D. degrees from the University of Illinois. In 1971, Knox College awarded him the honorary degree of Doctor of Humane Letters.

Professor Young has spent his academic career, beginning in 1941, at Emory University. He has served as Chairman of the Department of History, and has held fellowships from the Fund for the Advancement of Education, the Social Science Research Council, the U.S. Public Health Service, and the John Simon Guggenheim Memorial Foundation.

Health Quackery: An Historian's Advice

Excerpts from the Commencement Address By James Harvey Young, Ph.D., Professor of History, Emory University

As of this graduation moment, your knowledge of your health specialty stands at a peak of perfection. Some of you will proceed immediately to further training, but you are concluding a period of education that has taught you how to function at high levels of competence in accordance with the current state of the art. But the state of that art does not stand still. A fundamental difference between medical science and health quackery lies in the continual change of the former, which abandons old orthodoxies in the light of new knowledge acquired by research.

With quackery, nothing ever dies if it can be perpetuated or resurrected to beguile the gullible. If you as a health practitioner, hard-pressed by your busy life, stand still in the state of your knowledge, you will retrogress, slip backwards into what may fairly be termed "quackery" when measured against the advance of medical science. Many physicians do so stagnate, surveys have shown, settling into a routine during their first few years of practice that they modify but little during the rest of their professional careers.

Nor is the act of trying to keep up with the cutting edge of sound practice in your field sufficient. Your continual re-education must be done wisely. Your sources for keeping at the frontier of new knowledge must be, like Caesar's wife, above suspicion, journals and courses and conventions where no taint of commercial self-interest influences the information you receive from them.

Not only must you watch the manner by which you keep your mind alert, if you would avoid falling into a type of "quackery"; you also must mind your manners to keep your patients from forsaking you for quacks. Busy doctors sometimes don't take time to listen, brush off symptoms that seem less important to the doctor than to the patient, give short shrift to the bothersome repeater who complains a lot but reveals nothing organically wrong. Disillusionment with orthodox physicians—the rebuke that they just didn't seem to care—forms a strong undercurrent in much of the praise given to quacks by their most ardent champions.

Thus my first piece of advice to you graduating health professionals has been that you yourselves avoid complicity with quackery. My second words of counsel: Know your enemy and point him out. The quack is your enemy because he competes with you; in fact, his failures add to your workload. He is your enemy because of his massive, grievous impact upon the public health and purse. Because your commitment to your careers dedicates you to the protection and preservation of the public health, you must become the nation's first line of defense against pseudomedicine.

In our confused climate of ideas, many dubious faiths will flourish. It is an indispensable obligation, I submit, of the dedicated health professional to become informed about false faiths marketed in the health field, to condemn them, and to cooperate with regulatory officials in their suppression. I cannot end my remarks by predicting quackery's demise. But I can and do urge you so to act throughout the careers upon which you are just embarking that quackery's dimensions may be delimited and, thus, the public health and welfare be better served.

Nursing Student Writes Health Oath

There are graduation oaths for doctors, but not usually for other health professionals, Peggy Ward, a senior nursing student, discovered. She set out to prepare a special oath for her fellow graduates to recite.

The oath reflects a commitment to excellence in health care and to the basic principles of nursing.

Ms. Ward, who now works as a nurse at the Medical Center on Four Pavilion, spent several months over the past year developing the oath. She was a member of the College of Nursing graduation committee, whose advisors are Luther Christman, Ph.D., Dean of the College; John Graettinger, M.D., Dean of Faculty Affairs, Rush University; and William Kona, Director of the Rush University Library.

"I looked at the Air Force Oath and the Florence Nightingale Oath and the Red Cross Oath and got some ideas," Ms. Ward said. "Then I began to develop something on my own." She showed it to other committee members and to the advisors, refining it until it reflected the flavor of this institution.

"An oath for nursing students is not a tradition here yet," she said. "But we felt it was something we wanted to do. I hope next year's class decides to continue this as a tradition."

The Oath of the Health Professional

I solemnly pledge that as a health care professional I will conserve life and promote health as my fundamental responsibility.

The goals of my profession will stress the prevention of illness and promotion of health by teaching and by example. I also will assume the responsibility for creating a physical, social, and spiritual environment which will be conducive to recovery.

I will be loyal to my health science education, use my knowledge and wisdom in the pursuit of excellence in health care delivery. I will participate and share the responsibility with other citizens and memers of the other health professions o promote health on the local, tate, and international level without any barriers of race, creed, origin, or class.

Rush University Awards

he Phoenix Award

To Armando Susmano, M.D., for outstanding physician-teacher, presented by the Class of 1976. A graduate of the Buenos Aires School of Medicine, Argentina, Dr. Susmano joined the Department of Internal Medicine in 1967. He is assistant professor at Rush Medical College and associate attending in the Section of Cardiology at PSLH.

The Daniel Brainard Award

To Csaba Hegyvary, M.D., voted by students as the outstanding teacher in the basic sciences. He joined the Medical Center in 1972 and is associate professor at Rush Medical College in the Departments of Physiology and Internal Medicine. Dr. Hegyvary is a graduate of the Medical University of Budapest, Hungary.

The Nathan M. Freer Prize

To Hamilton Moses III, voted by the faculty as outstanding medical college student of the 1976 class. This award was endowed in 1892.

The Henry M. Lyman Memorial Prize

To Donna Schaible, presented in the junior year to an outstanding medical student. This award was endowed in 1908.

The David Peck Award

To Robert Lee Cavens, for contributions to the Student National Medical Association.

obert Lee Cavens, M.D., with William . Hejna, M.D., Dean of Rush Medical ollege.

Left to right: William F. Hejna, M.D.; Armando Susmano, M.D.; Csaba Hegyvary, M.D.; James A. Campbell, M.D.

Alpha Omega Alpha Honor Medical Society Graduates

Hamilton Moses III, President
Robert Jones, Secretary-Treasurer
Jeffrey Arbeit
Melody Cobleigh
Barbara Fuller
Diane Palac
Yvonne Winston
Allan Zelinger

The College of Nursing Undergraduate Faculty Award

To Karyn Holm, R.N., M.S., for the outstanding teacher, voted by the senior students. She is assistant professor, College of Nursing, and teacher-practitioner in Medical Nursing. A graduate of DePaul University, she came to the Medical Center in 1974 and is now working on her Ph.D. degree.

The College of Health Sciences Undergraduate Faculty Award

To John Kachmar, Ph.D., for the outstanding teacher, voted by the senior students. Dr. Kachmar, a graduate of the University of Minnesota, came to St. Luke's Hospital in 1958 as a biochemist and, in 1967, was appointed senior scientist at PSLH. He is associate professor of biochemistry in Rush Medical College and in the Colleges of Nursing and Health Sciences.

Rush-Presbyterian-St. Luke's Nurse Alumni Association Award

To Frank Philip Lamendola, for the outstanding nurse graduate.

Local Honor Society in Nursing

Undergraduate Nursing
Harold Berner
Marcia Bristo
Margaret Butler
Dale Ciesla
William Davis
Peggy Gerard
Eileen Gilles
Carol Glazer
Judith Goldberg
Beverly Hillman
Carolyn Jackson
Linette Javid
Joan Jensen
Kathleen Kapenga
Frank Lamendola
Anne Lesak
Suzanne Matuska
Paul Miller
Becky Moore
Patricia Rahe
Steven Ray
Shirley Siuciak
Nancy Soldau
Valerie Vodacek
Barbara Wawro
Patricia Williamson

Graduate Nursing
Patricia Andrews
Andrea Barsevick
Pamela Carlsen
Virginia Carr
Finda Clemmings
Sandra Graves
Susan Groenwald
Margaret Hansen
Lois Hatstat
Ann Henrick
Magdalene Iglar
Gloria Jacobson
Patricia Keith
Maralyn Keyes
Nancy Laatsch
Deborah Levi
Pamela McCullough
Rosalie Placet
Karla Stone
Michelle Stonecipher
Carol Taylor
Nancie Thole

Virginia Beebe, B.S., major in nursing.

RushRounds

Rush-Presbyterian-St. Luke's and Schwab Rehabilitation Hospital Sign Agreement

An agreement of association, aimed at improving and expanding medical rehabilitation services for the physically handicapped and at training increased numbers of rehabilitation specialists, was signed August 5 by officials of Schwab Rehabilitation Hospital and Rush-Presbyterian-St. Luke's Medical Center.

Spokesmen for Rush-Presbyterian-St. Luke's and Schwab said the agreement provides for integration of programs in rehabilitation medicine, education, and research at the two institutions.

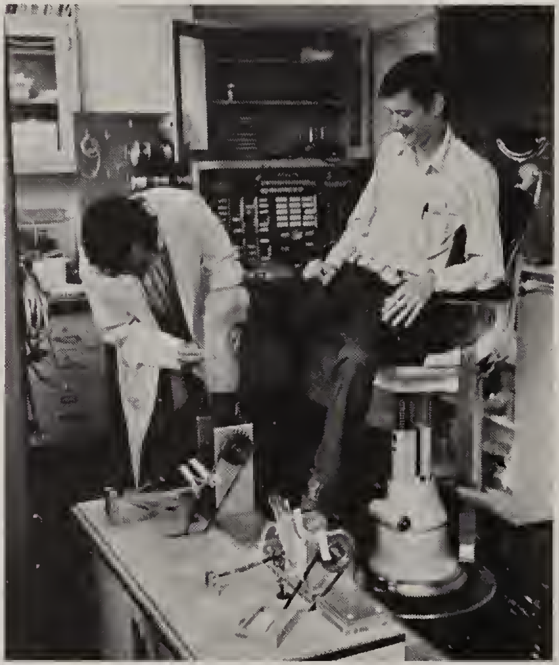
Schwab's residency program, a three-year graduate program that prepares physicians to specialize in physical medicine and rehabilitation and which the rehabilitation facility sponsors in cooperation with Mount Sinai Hospital Medical Center, will come under the direction of a new department of physical medicine and rehabilitation at Rush Medical College, established in December, 1975. A committee is conducting a search for a permanent chairman who will serve, concurrently, as director of professional services at Schwab Rehabilitation Hospital.

The Rush-Schwab agreement calls for participation of undergraduate students of Rush Medical College in patient care programs at Schwab; introduction of medical rehabilitation courses for students of Rush University's colleges of Nursing and Health Sciences; and development of research and continuing education programs. Qualified specialists at Schwab Rehabilitation Hospital will be appointed to the faculties of Rush University's colleges.

Both institutions retain their autonomy under the agreement of association. A joint policy committee, with Schwab and Rush equally represented, will explore the interrelationship of program goals in patient care, education, and research among Schwab, Rush-Presbyterian-St. Luke's, the Johnston R. Bowman Health Center for the Elderly, Mount Sinai Hospital Medical Center, and members of the Rush network of affiliated institutions.

Schwab Rehabilitation Hospital, 1401 S. California Boulevard, is the Midwest's oldest accredited medical rehabilitation facility. The 67-bed hospital provides rehabilitation programs for persons handicapped by strokes, spinal cord injuries, birth defects and developmental disabilities, arthritides, cardiopulmonary disorders, cancer surgery, amputations, multiple sclerosis, cerebral palsy, Parkinson's disease, and other disabling injuries and diseases.

Scientist Receives Research Career Development Award



Electrodes are attached to feed information into the computer.

Gerald L. Gottlieb, Ph.D., physiologist and biomedical engineer at the Medical Center, has received a $125,000 Research Career Development Award from the National Institutes of Health. Dr. Gottlieb is studying neurophysiological aspects of human voluntary and reflex motor actions.

"This award, determined on a national competitive basis and made to a limited number of scientists, is reason for special commendation of Dr. Gottlieb's scholarship," said David I. Cheifetz, Vice President for Scientific Affairs, and Director, College of Health Sciences.

Dr. Gottlieb's aim is to develop methods of measuring normal motor functions and to apply these methods to gain more insight into abnormal muscle control found in such disorders as Parkinson's disease and cerebral palsy.

"Little is known about the role of reflex mechanism in our normal movement, or how voluntary (conscious) actions affect reflex actions. Current theories are inconsistent, at best," Dr. Gottlieb said. "The muscles that move the ankle, for example, are monitored by the central nervous system (CNS) by muscles, tendons, and joints. Our aim in studying ankle movements is to determine which part of the CNS generates the reflex action and how the nervous system transfers information from nerve to muscle," he said.

"The ankle joint, although it is only a small portion of the body, is the ideal model for studying the body's many physiological ways of modifying and controlling the reflex action. Because of the design of our anatomy, there are several classes of reflex stimuli that can be applied selectively to the muscles acting on the ankle joint," Dr. Gottlieb explained. He has built a motor-driven "foot plate," which is wired to a computer, to help study what electrical signals are created in the human central nervous system in response to certain stimuli to produce reflex motions in the leg muscles.

The individual under observation sits in a chair and places one foot on the foot plate. When the device is turned on, the plate is moved up and down by the computer. Electrodes are taped to the ankle to feed information into the computer.

The apparatus is programmed to interrupt simple voluntary movements suddenly, providing a stimus that induces a reflex response the subject. Both voluntary and flex actions are observed, recordd, and compared.

Dr. Gottlieb said this research ay pinpoint effects of oscillation nd vibration on limbs of industrial orkers who operate vibrating mahinery as part of their job, and lead setting better safety standards r occupationally hazardous job lassifications. The research findgs may also enable scientists to nprove the design of batteryowered artificial limbs.

Medical Center Acquires Body and Brain Scanners

The Medical Center continues to emain in the forefront in body and rain scanning. During the past ear the Center has obtained a nulear body scanner and a computed omography body scanning machne.

A prototype of an advanced nulear body scanner that aids in early iagnosis of tumors has been testd and improved in the Department f Nuclear Medicine, under the dirction of Ernest W. Fordham, M.D., hairman.

The prototype instrument, called he Anger multiplane tomographic ectilinear scanner, has been tested n Nuclear Medicine over the past wo years. The Medical Center and he University of California, Los ngeles, were the only two instituions in the U.S. to test prototypes. he improved instrument, called he Pho-Con Multiplane Imager, as installed in Nuclear Medicine n March.

"Nuclear imaging uses the noral functions of various organs. aterial known to be absorbed by a pecific organ is tagged with radioctive atoms and injected into the atient," explained Dr. Fordham. The organ can be visualized either hile picking up the radioactive aterial or after the pick-up is comlete. Pictures of the organ obtaind by the radionuclide method illustrate functional anatomy."

Technician Amy Esposito makes adjustments on nuclear body scanner computer (above) as patient undergoes tests (below).

During a single scan, the Pho-Con instrument generates 12 simultaneous internal pictures of the body. Each image focuses on a different plane of the patient, detecting tumors and lesions often not detected by other conventional nuclear instruments or conventional x-ray devices.

The Pho-Con Multiplane Imager, costing $145,000, was developed by G.D. Searle and Co., Skokie, Ill.

During the two-year testing of the prototype, the instrument brought a greater degree of accuracy to the detection of tumors. Disease is picked up in overlying or associated normal tissues by use of radionuclides and exposed by the tomographic effect, which permits the physician to view his patient as if separated into a series of longitudinal slices.

Some tumors pick up certain radiopharmaceuticals directly; it is in defining the presence and exact location of these tumors that the Pho-Con is most useful.

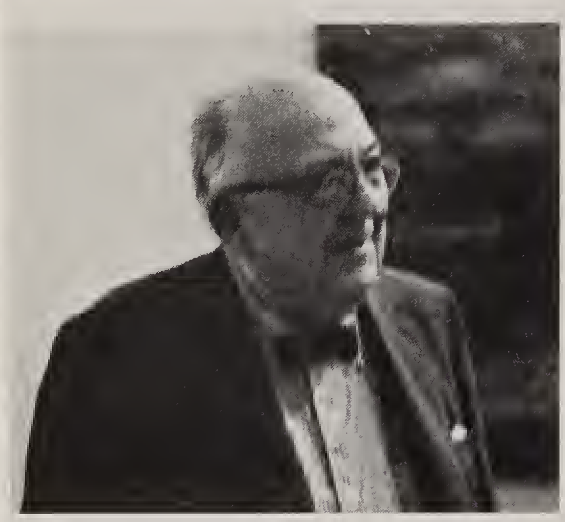
The Medical Center has also received a computed tomography body scanning machine—the first in Illinois and the third in the U.S. This purchase, in addition to the two EMI brain scanners already in use, brings the Medical Center's investment in scanning equipment to more than $1.5 million.

Efficiencies in staffing and computer time sharing, plus an increase in the volume of patients utilizing the three computed tomography units, have resulted in a reduction in expenses incurred per patient examination. Charges to patients for brain scan exams have been cut roughly 40 percent.

The Medical Center is committed

to the use of this technology, and plans to establish the Rush Computed Tomography Center are well underway. This may result in additional cost savings, which also would be passed on to patients.

Symposium Honors Dr. Capps


Richard B. Capps, M.D.

Basic science, clinical medicine, and Rush history blended March 16 in a unique tribute to mark the 70th birthday of an outstanding physician and scholar.

The day-long Richard B. Capps Symposium on Perspectives in Viral Hepatitis brought together some of the world's foremost authorities in that field. Physicians and scientists from England, New York, New Jersey, Washington, Texas, and Minnesota delivered original papers in a unique tribute to Dr. Capps, attended by more than 200 physicians in the A. B. Dick Auditorium.

The tribute was sponsored by a group of friends of Dr. Capps and by Abbott Laboratories. The entire proceedings were published in a 30,000 copy special issue of the *Rush Medical Bulletin*.

Dr. Capps, author of more than 100 scientific articles, is perhaps best known for his studies of acute infectious hepatitis among soldiers in the Mediterranean Theater during World War II and for his discovery that babies can be carriers of hepatitis and can transmit it without becoming ill themselves.

Besides his scientific accomplishments, Dr. Capps is noted as an exceptional clinician. His friend and colleague, Dr. Philip Jones, former president of the medical staff, has described him as "a superb clinician and teacher who is extraordinarily loyal and devoted to his patients. He is an unusually compassionate person."

Researchers Find Brain Atrophy in Alcoholics

Brain atrophy, a possibly irreversible loss of brain tissue often associated with old age, has been found to be prevalent among chronic alcoholics, including those in middle age or younger, according to two separate but cooperative studies recently completed at the Medical Center.

Both studies used computed axial tomography, a new type of imaging system that gives three-dimensional pictures of the brain.

Principal investigator for the first study, published in the July 26 issue of the *Journal of the American Medical Association,* is Jacob H. Fox, M.D., Associate Professor of Neurology. Co-investigators are Ruth G. Ramsey, M.D., Assistant Professor of Diagnostic Radiology; Michael Huckman, M.D., Associate Professor of Diagnostic Radiology; and Anthony E. Proske, M.D.

Principal investigator for the second study, which was reported at a recent meeting of the National Council on Alcoholism, was Phillip S. Epstein, M.D., Assistant Professor of Psychiatry and Chief Psychiatrist of Rush's Alcoholism and Substance Abuse Program. Co-investigators were Vincent D. Pisani, Ph.D., Assistant Professor of Psychiatry and director of the program, and Jan A. Fawcett, M.D., Stanley G. Harris, Sr. Professor and Chairman of the Department of Psychiatry.

Dr. Fox's group found that the size of brain ventricles in chronic alcoholics is "much larger" than in nonalcoholic patients, implying irreversible loss of brain tissue. Ventricles are small cavities in the brain. As brain cells are lost, brain tissue shrinks and the ventricles become larger. This is correlated with a loss of brain function. Dr. Fox's group now plans to investigate whether these patients have a corresponding loss of intellectual function, and whether it is permanent.

The investigators studied tomographs of 12 alcoholic patients hospitalized for neurologic symptoms such as confusion, memory loss, and seizures. The patients ranged in age from 34 to 74 years. All had been alcoholics at least five years, and all had evidence of liver disease. They were compared with a group of 60 nonalcoholic patients who also had been hospitalized for neurologic disorders and who had brain scans taken.

Despite the fact that the control group was slightly older than the alcoholic group, and that the incidence of enlarged ventricles is reportedly higher in older people, "the alcoholic patients had significantly higher mean ventricle size than the controls," the study found. One third of the alcoholic patients had "markedly enlarged" (more than 20 mm) ventricles, compared to less than two percent of the controls.

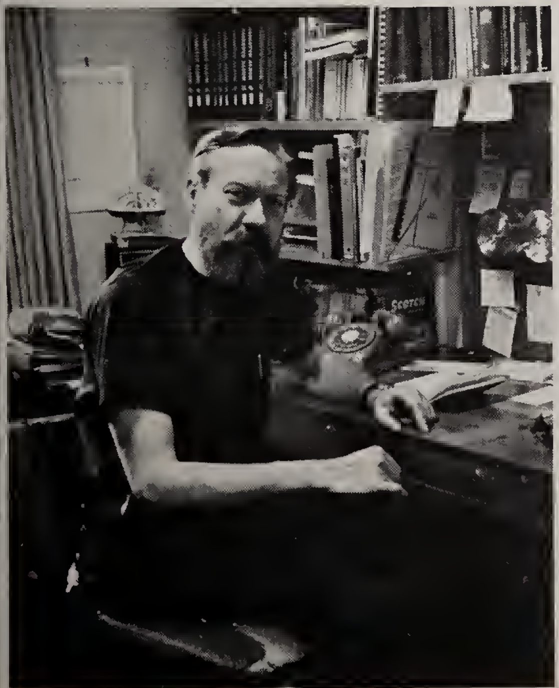
Dr. Epstein's group conducted a retrospective study of 46 alcoholic patients whose brains had been scanned by tomography. Ages of the patients ranged from 31 to 69 years, with a mean age of 47.8. Of these patients, 61.4 percent showed signs of cerebral atrophy. While atrophy was most prevalent in those patients between 50 and 59 years of age, "48 percent of the patients evidencing atrophy were under age 50, and 25.8 percent were younger than 40."

Alcoholic patients reporting daily alcohol consumption regardless of amount were considered steady drinkers. Alcoholic patients reporting abstinent periods ranging from weeks to months were considered periodic drinkers. Some 76.8 percent of the patients with atrophy were steady drinkers, and 23.1 percent were periodic drinkers. However, most of the periodic drinkers in the group, 85.7 percent, showed atrophy, compared to 55.6 percent for steady drinkers. "Every periodic drinker among the male population evidenced cerebral atrophy," Dr. Epstein and his co-investigators found. The highest prevalence of atrophy was found among nonwhite female alcoholics.

Department of Religion and Health Established

The Trustees of the Medical Center this summer approved establishment of an academic department of Religion and Health in the College of Health Sciences of Rush University and the appointment of the Rev. Christian A. Hovde, Ph.D., as its chairman. The Rev. Dr. Hovde also was named to the Bishop Charles P. Anderson chair of religion and health.

James A. Campbell, M.D., president of the Medical Center, recommended that the new department be created to incorporate the traditional pastoral training program and its expanding training interests into Rush University. He proposed the Rev. Dr. Hovde for the chairmanship upon the recommendation of a faculty search committee.



Rev. Christian A. Hovde, Ph.D.

The department, organized within the College of Health Sciences, will provide pastoral care services at the request of patients and families at the Medical Center, and will encourage additional consultation among clergymen and physicians. It will coordinate clinical and theoretical educational and research programs, augmenting the graduate educational programs at Rush University. A nationally recognized clinical pastoral education program, begun in 1968, prepares students to assume pastoral care and counseling responsibilities on specialty units in the Medical Center or in other specialized ministries.

As chairman of the department, the Rev. Dr. Hovde will help to plan interdisciplinary courses and research programs, on graduate and undergraduate levels, dealing with development of ethical and medical concerns associated with advances in life sciences.

The chair of religion and health was established with support of the Bishop Anderson Foundation. An Episcopal church organization, it was formed in 1950 to conduct—across denominational lines—charitable programs of religious, educational, and cultural activities to benefit medical and allied health professions. Since 1963, the Rev. Dr. Hovde has been the director of the Foundation, which was named for Charles P. Anderson, a former Bishop of Chicago and a presiding Bishop of the Episcopal Church in the U.S.

Home Health Service Cares For Homebound Patients

Always a strong and healthy man, John was just settling into retirement when he began having trouble walking. His legs felt weak. Periodically, his legs would tremble, and it was all he could do to shuffle to a chair. To make matters worse, his speech would sometimes become slurred.

A series of tests at the Medical Center confirmed that John had Parkinson's disease, a disease of the nervous system characterized by muscle weakness and tremors. There is no cure, but drug treatment could limit the problems associated with the disease.

John was released from the hospital after two weeks to continue his recuperation and treatment at home. Prior to discharge, a nurse from Extended Care (discharge planning) implemented a referral to Rush Home Health Service, begun in December, 1975, by the College of Nursing's Community Health Nursing Department. A Community Health staff nurse visited John at home within two days after discharge. The staff nurse is responsible for checking his condition, his blood pressure, teaching him about the disease and how to cope with it, and making sure he can manage his needs. Now he's able to care for himself in his home environment, with occasional visits to his doctor to supervise his treatment.

The purpose of the Rush Home Health Service is to provide skilled nursing care and other therapeutic and rehabilitation services to patients who are homebound. The advantages of the program are numerous. It gives Medical Center physicians an option for earlier discharge of patients; reduces the risk to patients of being rehospitalized; increases continuity of care from hospital to home; and optimizes placement of patients in the most therapeutic setting at the most appropriate time.

Three full-time staff nurses and four teacher/practitioners, assisted by students in the College of Nursing, administer the caseload of patients. Prudence Gaines, R.N., field unit leader, makes patient assignments to community health nurses and students.

Referrals to the Rush Home Health Care Service are facilitated through Extended Care Nursing (ECN), as are all referrals for community nursing services. "As experts in the use of past hospital resources, extended care nurses are the key link in referring patients to the Rush Home Health program," Ms. Gaines said.

What are the services offered by the Home Health program? Currently, Community Health nurses help patients and families to manage health problems at home. This includes nursing techniques, health maintenance, and the medical management of illness of selected homebound patients.

"Home care services will bring about significant advantages for the client, including enhancing recovery and rehabilitation, improving the accuracy of history taking, and saving the costs of ambulance fees for trips to the hospital," said Iris Shannon, B.S.N., M.A., Chairperson, Community Health Nursing.

Medical Center Establishes Three New Chairs

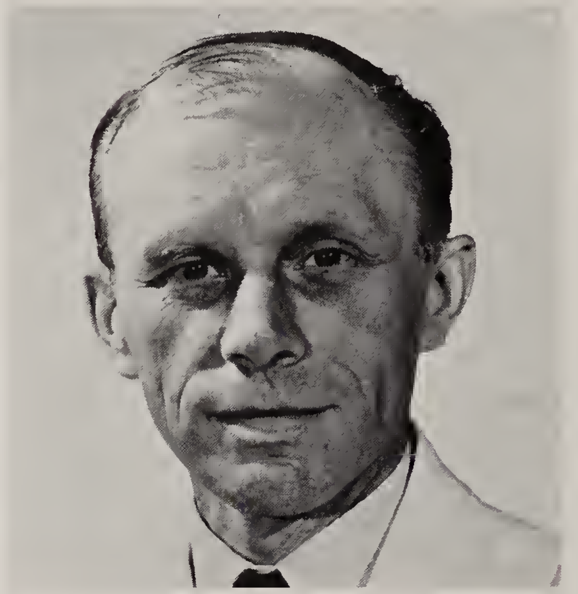
Three new chairs have been established this year at the Medical Center. Robert S. Eisenberg, Ph.D., has been named first occupant of the Francis N. and Catherine O. Bard Chair of Physiology, and Charles P. Perlia, M.D., Director, Oncology Section, Department of Internal Medicine, has been named first holder of the Samuel G. Taylor III, M.D., Chair of Oncology.

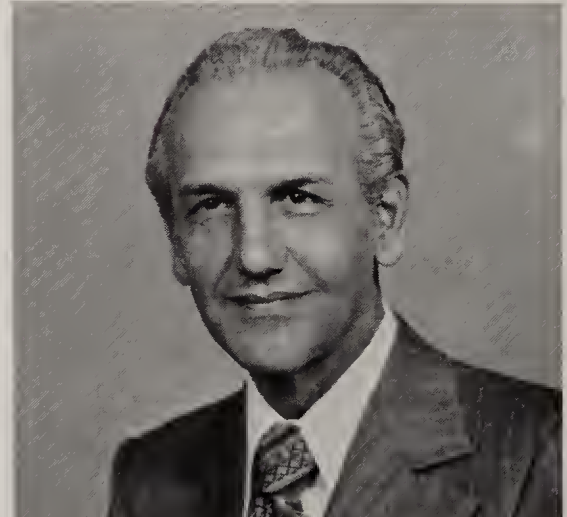
Dr. Eisenberg was appointed Professor and Chairman of the Department of Physiology in the College of Health Sciences of Rush University this summer. He came to the Medical Center from the University of California in Los Angeles, where he was Professor of Physiology.

A native of Brooklyn, N.Y., Dr. Eisenberg earned a B.S. from Harvard College in 1962 and received a Ph.D. in 1965 from University College, London, England.

The author of more than 50 publications, Dr. Eisenberg is a member of numerous societies, including the Institute of Electrical and Electronic Engineering; American Association for Advancement of Science; American Physiological Society; and the Society for Industrial and Applied Mathematics.

Robert S. Eisenberg, Ph.D.


Charles P. Perlia, M.D.


Joseph R. Christian, M.D.

The Francis N. and Catherine O. Bard Chair was made possible by the provisions of the will of Francis Norwood Bard of Barrington, Ill., a Chicago area civic and business leader who maintained a continuing personal interest in biology, geriatrics, and biological research at Rush-Presbyterian-St. Luke's until his death on Jan. 23, 1970.

The Taylor Oncology Chair was endowed for more than $1 million by 926 individual donors in honor of Dr. Samuel G. Taylor III, a 1931 Rush Medical College graduate who has been a member of the Rush faculty since 1933. Director of the Oncology Section from 1956 to 1971, he is now consultant to the section. He is also Associate Director of the Rush Cancer Center. Dr. Taylor was instrumental in forming the Illinois Cancer Council and served as its first president from 1972 to 1974. Currently, he is Director of the Council. He has served in advisory posts with the National Institutes of Health and the American Cancer Society.

Dr. Perlia is Professor of Medicine at Rush University and attending physician at Presbyterian-St. Luke's Hospital. He was appointed Director of the Oncology Section in 1971. Dr. Perlia is also Co-Director of the Tumor Clinic and Co-Chairman of the Tumor Committee at the hospital.

"The Samuel G. Taylor III Chair of Oncology, together with Dr. Perlia's appointment, is a fitting tribute to Dr. Taylor, a distinguished medical educator, research scientist, and practicing physician who pioneered in the cancer field for more than 30 years and who has influenced the lives of hundreds of young physicians," noted Dr. Campbell.

The Woman's Board Chair of Pediatrics, funded by the Woman's Board of Rush-Presbyterian-St. Luke's, was also fully endowed during the past year. Joseph R. Christian, M.D., Professor of Pediatrics at Rush Medical College and Senior Attending Physician at Presbyterian-St. Luke's Hospital, was named Woman's Board Chairman of Pediatrics.

Alumni Bulletin

Alumni Association of Rush Medical College

President
R. Gordon Brown '39

Board of Directors
C. Arnold Curry '73
Frederic A. dePeyster '40
John M. Dorsey '31
Stanton A. Friedberg '34
Sol A. Goldman '37
Gregory Graves '74
R. Lincoln Kesler '35
Ronald Neslon '74
George A. Nicola '37
R. Joseph Olk '75
Floyd F. Shewmake '73
Simon M. Shubitz '36
William D. Sicher '40
Wayne W. Wong '40
Willard Wood '30

Alumni Trustees of Rush-Presbyterian-St. Luke's Medical Center
R. Gordon Brown '39
R. Joseph Olk '75
Wayne W. Wong '40

Life Trustees
William J. Hagenah '68
Frank B. Kelly, St. '21

Alumni joined 200 other luncheon guests just before the dedication ceremonies for the new Academic Facility. From left to right are: George Shaw, M.D., '29; JayJ. Crane, M.D., '20; Simon Shubitz, '36; Mrs. William F. Hejna; George Nicola, M.D., '37; William F. Hejna, M.D., Dean, Rush Medical College, and Senior Vice President of the Medical Center.

RMC Alumni Sponsor Dedication Symposia

More than 130 Rush Medical College alumni helped dedicate the new Academic Facility of Rush University by taking part in a series of symposia in connection with the Alumni Association's annual meeting on the day preceding the dedication.

The symposia, held in the new Lecture Center of the Academic Facility, were preceded by tours of the Academic Facility, visits with the President and Deans, and the annual luncheon meeting. (See page 62 for program details of the dedication symposia.)

James A. Campbell, M.D., Medical Center President, welcomed alumni to the Annual Meeting, expressing his hope that "this be a time of renewal of all of us," and that the dedication of the Academic Facility be used as "an episode in our continuum from one generation to the next to give us a chance to recreate our relationships with one another and with Rush University."

In noting that approximately one of every 20 Rush Alumni of the Medical College were present, Dr. Campbell praised the alumni for their vitality, durability, and vision in helping to bring the Medical Center to its present status.

William F. Hejna, M.D., Senior Vice President and Dean, Rush Medical College, brought the alumni up to date on student enrollment, faculty size, National Intern and Resident Matching Program results, and curriculum development. He said, "We are stabilized in terms of class size and in terms of faculty. The three colleges of Rush University are established and functioning well, and our basic science departments are all in place."

Dr. Hejna referred to the new Academic Facility as the "Rolls Royce of architecture for medical schools," but emphasized that the "real vitality of the building is in the academic program and in the people who will make the programs work."

In reviewing progress of the Rush Medical College Alumni Association, trustee Wayne Won Wong, M.D., of Honolulu, said that gifts from the alumni have increased 130 percent during the past 12 months and that efforts are underway through the new executive council to organize the membership to bridge the gap geographically and expand membership outside the local Chicago area.

B. A. Bridgewater, Trustee and Chairman of the Trustees Committee on Alumni Leadership and Executive Vice-President of Baxter Laboratories, discussed alumni responsibilities from the trustee viewpoint.

"What becomes strikingly clear, regarding Rush Alumni financial support, is that there is a giving gap which normally would have been filled by the increasing alumni support from those who would have

Continued on page 63

Dedication Symposia
September 13, 1976

Schedule of Events

"Benjamin Rush — Heritage and Hope"
by C. Frederick Kittle, M.D.
Department of Cardiovascular-Thoracic Surgery, Rush-Presbyterian-St. Luke's Medical Center
(Dr. Kittle's paper appears on page 46)

"Computerized Tomography of the Abdomen"
by Jerry P. Petasnick, M.D.
Department of Diagnostic Radiology, Rush-Presbyterian-St. Luke's Medical Center

"Bone Marrow Transplantation in Leukemia and Aplastic Anemia"
by William H. Knospe, M.D.
Department of Internal Medicine, Rush-Presbyterian-St. Luke's Medical Center, and
Stephanie A. Gregory, M.D.
Department of Internal Medicine, Rush-Presbyterian-St. Luke's Medical Center

"Neuroendocrine Tumors: Clinical-Pathological Correlations"
by Victor Gould, M.D.
Department of Pathology, Rush-Presbyterian-St. Luke's Medical Center

"Advances in Urological Oncology"
by James E. Gottesman, M.D.
Department of Urology, Rush-Presbyterian-St. Lukes's Medical Center

"The Role of Immunofluorescence and Electron Microscopy in the Evaluation of Renal Biopsies"
by Melvin M. Schwartz, M.D.
Department of Pathology, Rush-Presbyterian-St. Luke's Medical Center

"Newer Therapies for Breast Tumors"
by Steven G. Economou, M.D.
Department of General Surgery, Rush-Presbyterian-St. Luke's Medical Center

The Class of 1926

ROW 1 (Left to Right): George B. Callahan, Waukegan, Illinois; Lucia E. Tower, Chicago, Illinois; I. Pat Bronstein, Chicago, Illinois; Esther S. Somerfield, Los Angeles, California; Ellen Fooklen Leong, New York, New York; Angus C. McDonald, Downey, California. *ROW 2* (Left to Right): John W. McHaney, Jefferson City, Missouri; Joseph E. Jensen, Laguna Hills, California; Chauncey G. Burke, Pontiac, Michigan; Gilbert C. Bishop, Almont, Michigan; Libby Pulsifier, Rochester, New York; Walter P. Blount, Milwaukee, Wisconsin; Stanley E. Lawton, Glendora, California. Present, not pictured: Samuel A. Leader, Chicago, Illinois.

50 Years of Service

Physicians honored for 50 years of service at the Medical Staff Dinner included (Left to Right): Alfred P. Solomon, M.D., Harold I. Meyer, M.D., and Grant H. Laing, M.D. Not pictured are Arthur J. Coombs, M.D., Clark W. Finnerud, M.D., and Heyworth N. Sanford, M.D.

ontinued from page 61

raduated in the 1942-1973 per-
d — had there been graduates."
e stressed that this giving gap
as to be met if alumni support is
help maintain the level of excel-
nce we have at Rush today.

"In order to fill the giving gap, we
ust turn essentially to the older
ush Alumni for contributions to
ll in that period," he said.

Mr. Bridgewater concluded by
aying, "I ask you not only to con-
der participation in the future of
e Medical Center, but to become
vangelists for its cause. A word
om you to a fellow alumnus can
e far more valuable than volumes
f print or words that I speak here
day. Your presence here bears
itness to your concern and care
bout the Rush of today and tomor-
w."

William F. Hejna, M.D.

lumni gathered in one of the twin amphitheaters of the new Academic Facility of
ush University for the Rush Medical College Symposia commemorating the
edication. The Symposia followed the annual meeting of the Alumni Association
f the medical college. The alumni then adjourned for a reception in Room 600.

Jay J. Crane, M.D., Receives 1976 Distinguished Alumni Award

Medical Center President, James A. Campbell, M.D., congratulates Jay J. Crane, '37, 1976 Distinguished Rush Alumnus.

The 1976 Distinguished Alumni Award was presented to Jay J. Crane, M.D., '20, in recognition of his "eminent 55-year career, a contribution which has advanced both the science and the practice of urology."

George Nicola, M.D., '37, in presenting the award, said: "As clinical professor at the University of Southern California School of Medicine and as Chairman of the Department of Urology, as a practitioner, a distinguished gentleman, and friend, the recipient of this award today exemplifies the outstanding physician to our present Rush students—and is a great source of pride to his fellow alumni."

A graduate of the University of Nebraska, Dr. Crane completed his internship at Los Angeles County General Hospital. He has been associated with the University of Southern California School of Medicine for 55 years. He was professor of urology and chairman of the urology section at the school of medicine before being named professor emeritus in 1957. He is still active on the staff.

A member of numerous professional organizations, Dr. Crane is a past-president of the Los Angeles County Medical Association and a Fellow of the American College of Surgeons.

Some Practical and Philanthropic Considerations In Light Of the Tax Reform Act of 1976

We have only to review the history of Rush-Presbyterian-St. Luke's Medical Center and its predecessors to recognize the impact of philanthropy in our growth and progress. The tradition of generosity which established Rush Medical College in 1837, St. Luke's Hospital in 1864, and Presbyterian Hospital in 1883, continues to play a crucial role in the advancement of the Medical Center commitment.

The primary impetus for donors who give to the Medical Center is the knowledge that their substance will be used wisely in crucial research, education, and health care programs. Giving, particularly through significant bequests, presents an opportunity to create a meaningful and lasting memorial. A peripheral issue in the philanthropic decision-making process is the effect of taxation.

The Congress has passed, and the President has signed, the Tax Reform Act of 1976—1,500 pages of new regulations ranging from the simplification of forms to the designation of fishing boat crewmen as self-employed individuals.

In the "lifetime" taxation area, the extension of the holding period for appreciated property is most significant. Prior to the enactment of the new tax reform, the sale of appreciated property could be treated as long-term capital gain if the purchase of the property preceded the sale by at least 6 months. Under the new law, appreciated property must be held for at least 12 months to qualify for capital gains tax treatment. For those whose investment success leaves room for improvement, it should be noted that the new 12-month holding period applies to declaration of capital losses as well.

What does the extended holding period mean to donors to Rush-Presbyterian-St. Luke's Medical Center?

Now, donors must select securities which have a 12-month holding period to deduct the full fair market value. When contemplating a gift to the Medical Center, it would be wise to select those holdings which have a long-term appreciation of 12 months or more and, if possible, to select those holdings which have the lowest cost basis in relation to the present fair market value.

The most sweeping reform which impinges upon charitable giving is in the area of estate taxes.

Unified Estate/Gift Tax

As a result of the 1976 Tax Reform Act, a new unified rate of taxation applies to lifetime and estate transfers. In essence, the preferential treatment of lifetime gift transfers is eliminated, and all transfers are treated as if made at death.

Estate taxes will be determined by applying the new rates (from 30% to 70%) to the total of lifetime transfers and those made at death, minus any gift tax paid prior to the reform.*

Whereas the prior rule allowed one-half of the adjusted gross estate to pass to a surviving spouse free of estate tax liability, the new regulations allow a deduction fo $250,000 *or* one-half the estate, whichever is *greater.* This change benefits persons with smalle estates, but does not affect large estates in which one-half the estate exceeds $250,000.

How do the new regulations affect contemplated bequests to Rush-Presbyterian-St. Luke's?

The estate tax benefit of a bequest to the Medical Center remains unchanged. The taxable estate is still reduced by the amount of the charitable beques and the estate tax rate on the remainder passing to heirs is reduced accordingly. It is safe to assume that bequests will continue to be one of the most popular methods for donors who wish to make significant gifts to Rush-Presbyterian-St Luke's.

Conclusion

The primary motivation for donors who support the Medical Center through outright gifts, bequests, and deferred giving agreements is the desire to play an active role in the academic and patient care enterprise in progress at Rush-Presbyterian-St. Luke's. The tax incentives which are built into the Internal Revenue Code underscore the American commitment to private, voluntary support and control. A complete understanding of the tax incentives for giving calls for the counsel of each donor's legal and financial advisors. Although the Medical Center is eager to assist each donor in his or her estate planning, we strongly encourage consultation with personal counsel.

Please let us know if we can help.

TO: Office of Estate Planning
Rush-Presbyterian-St. Luke's Medical Center
1725 W. Harrison St., Room 920
Chicago, Illinois 60612

From: ______________________________

Street: ______________________________

City: ______________ **State:** __________ **Zip:** __________

Telephone: ______________________________

Please contact me regarding bequests and memorial opportunities at Rush-Presbyterian-St. Luke's Medical Center.

**This is an extremely simplified explanation and does no account for transitional rules which, in essence, produce the same result.*

he Magazine, incorporating the Bulletin of the Alumni Association of Rush edical College, is a publication of the Office of Philanthropy and Comunication, Rush-Presbyterian-St. Luke's Medical Center.

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